THE IRON AGE

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Steel Casting Plant at Oakland, Cal.

Teapot Ladle for Castings Weighing Up to 4500 lb.—Products Include Parts for Tractors, Dredges and Alloy Steels for Mining Work

The C. L. Best Gas Traction Company operates a foundry and machinery plant at Elmhurst Station in East Oakland, Cal. The foundry work proper is carried on under the name of the Best Steel Casting Company. The methods used in the foundry follow standard practice generally but some deviations have been made which have proved successful. Operations were begun in a small building 50 x 50 ft. in 1911, and the business has grown to such proportions that it is now housed in a building 100 x 350 ft. and is one of the important enterprises of the East Bay region.

Shipping facilities are afforded by the east shore line of the Southern Pacific Company which runs alongside the factory and gives quick connections with transcontinental lines north, east and south. Oakland harbor is easily accessible and the main line of the Western Pacific is a few blocks distant. Owing to the location in a new residence community, low-price homes in the immediate vicinity of the works are afforded the workmen.

The company builds a gasoline engine and a tractor of a type particularly for use over sand and boggy ground. It uses a track-laying device, embodying some unusual ideas of construction. The tractor is built complete in the company's plant. The foundry department handles all the castings. About 20 per cent. of the output of the foundry is used in the construction of the tractors and the major portion of the business is contract work in the making of parts for general machine construction, suction and gold dredges and chrome steel for

The Teapot Ladle During the Pouring Operation. This Form of Ladle Is Generally Used on All Work up to the Larger Castings

mining work. Blank carbon gears form also a considerable part of the company's output.

The castings made include chrome nickel, plain nickel, plain chrome, common carbon in various proportionings, manganese and vanadium. Low phosphorus iron coming mostly from the Cornwall field in Pennsylvania and steel scrap are used, the percentage of scrap running from 45 to 55 per cent. The mixture is melted in a coke-fired cupola and transferred to a 2-ton Whiting converter, pre-heated with oil. The blast is furnished by a Root blower. A teapot ladle is generally used in the pouring process, an uncommon practice, on all castings up to large ones weighing 4500 lb. and above, in which cases lip pouring is used or in some special instances, depending on the type of casting, bottom pouring is employed. The teapot ladle has been found in this shop to give a cleaner metal, the metal stays hot longer and there is practically no freezing in the spout, due to the carefulness used in the pouring. Stack pouring is used on small parts, the molds being stacked five or six high.

An oxy-acteylene torch is used for eliminating blowholes and for cutting heads and risers from the castings. Swinging grinders are also used. A 10-ton Whiting overhead crane of the bridge girder type is used in the central bay.

C. L. Best is president of the company; H. H. Whiting, manager; John Touhy, foundry superintendent, and C. P. Bannon, sales manager. The latter maintains offices in the Sheldon Building, San Francisco.

The Electric Steel Company of Indiana has put an electric furnace in operation in its plant in Indianapolis. This is the first Heroult furnace in that part of the State. The Indianapolis Light & Heat Company furnishes the current. The company is a recent organization, with officers as follows: Hugh McK. Landon, president; P. J. McNamara, vice-president; W. N. Voliva, secretary-treasurer, and J. M. Ryan, general manager. Mr. Ryan came from the Canadian Steel Foundries, Montreal, where he was assistant superintendent, and before that was connected with the Mesta Machine Company, Pittsburgh.

RAPID CAR DUMPING PLANT

Disappearing Haulage Car Helped to Increase Speed and Reduce Attendance

A car dumper recently erected on the Cincinnati, Hamilton & Dayton Railroad dock at Toledo, Ohio, by the Wellman-Seaver-Morgan Company, Cleveland, has established a remarkable record for speed. This machine unloaded 340 cars of coal into Lake boats in 10 hr., or an average of 34 cars per hr. The best time for 1 hr. was 49 cars. During 5 hr. 185 cars were unloaded or an average of 37 cars per hr. The time includes that taken for the shifting of the boats in order to dump the cargoes into different hatches. This unloader has a capacity for handling coal cars of 100 tons capacity, the largest made. Those that were unloaded during the record operation were of varying capacity. A record was also made in the time required for the erection of this dumper. The contract for it was placed October 27, 1914, and the first car of fuel was dumped on April 19, 1915, or less than six months after the placing of the contract.

A Recently Erected Car Dumping Plant Which Has Established an Average Speed Record of 34 Cars per Hr. A Special Disappearing Haulage Car Running Into a Trough Under the Track Is a Feature That Tends Toward a Reduction in the Amount of Labor Required

The dumper itself is largely similar in design to ones recently erected by the Wellman-Seaver-Morgan Company in Cleveland and Sandusky for the Pennsylvania Lines, the most important change being in the use of a disappearing haulage car. This cable-propelled haulage car instead of being lowered into a pit under the inclined track goes down into a trough under the track as shown in the illustration, the track being raised and lowered at each end of the trough by a swinging gate. The haulage car after pushing a loaded car on to the machine is run back and down through the trough, coming up behind the next loaded car that has been run down on the track in front of the machine. The use of the disappearing haulage car saves a number of employees as compared with the former pit arrangement. With this plant the cradle that carries the car up to the pan and spout into which the fuel

is dumped by turning the car over, is elevated 30 ft. above the water or 5 ft. higher than the elevation in most plants of this type.

SPIRAL MILLING ATTACHMENT

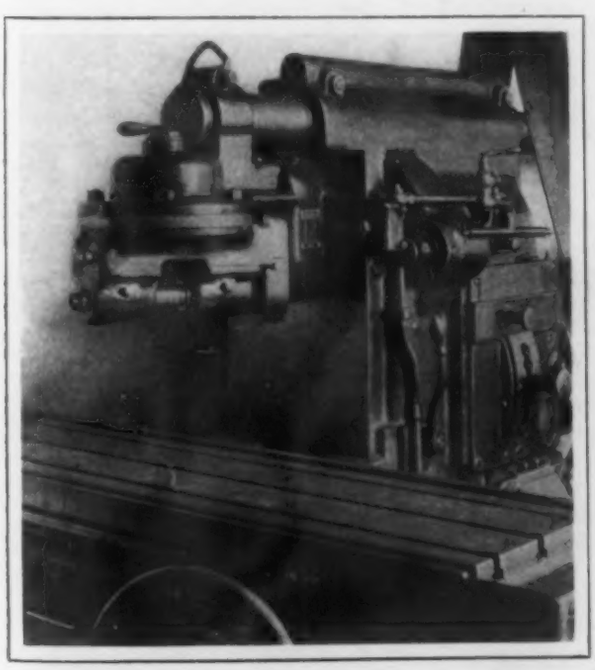
A New Brown & Sharpe Device for Use in Combination With a Spiral Head

A spiral milling attachment has been brought out by the Brown & Sharpe Mfg. Company, Providence, R. I., for use in combination with a spiral head for heavier classes of work. It is made in four sizes and is adaptable to practically the entire line of plain and universal machines built by the company.

The accompanying halftone shows the attachment in place on the machine. It will be noted that the method of clamping to the overhanging arm as well as to the face of the column makes the attachment practically a part of the machine. To facilitate handling, provision is made for attaching a hook at the top.

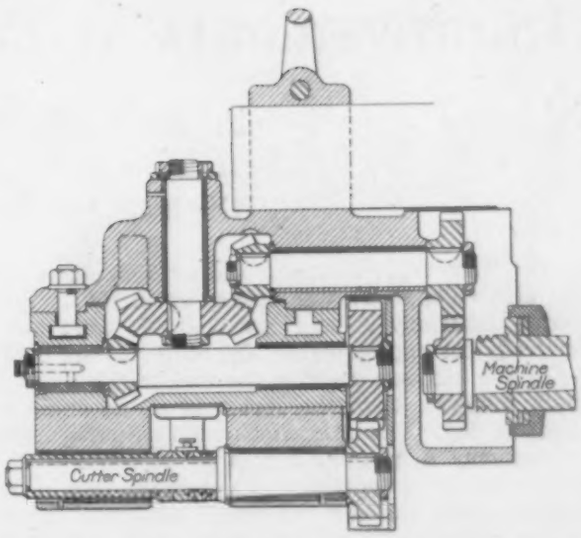
The spindle is hardened and ground and runs in phosphor bronze boxes having means of compensation for wear. It is driven from the machine spindle by hardened steel spur and bevel gears, as shown by the vertical section, and can be set at any angle in a horizontal plane, the position being indicated by graduations reading to half degrees. To insure rigidity and enable heavy cuts to be taken the cutter spindle is provided with an outer bearing which can be easily removed when placing a cutter in position.

The inner spindle bearing is adjustable by a screw having a graduated dial on the front end of the attachment which reads to thousandths of an inch. This is employed when setting the cutter central with the swiveling point or when off-setting the cutter any definite amount. A gauge enables the cutter to be set central with the swiveling point. It



A New Milling Machine Attachment That Has Been Developed for Use in Connection with a Spiral Head on Heavy Work

slides in V-ways on the attachment, a thumb-screw clamping the gauge at any desired distance from the cutter spindle. The regular machine spindle speed change mechanism is used to obtain the different cutter speeds. All gears and wearing surfaces are inclosed to prevent injury from dirt and dust.



Vertical Section Showing the Mechanical Construction of the Attachment

The New Australian Steel Plant Operating

The new steel plant of the Broken Hill Proprietary Company, Ltd., at Newcastle, New South Wales, began operations about March 15 by blowing in a 350-ton blast furnace, according to U. S. Consul Lucien N. Sullivan in Commerce Reports writing under date of April 26. One blast furnace, three open-hearth furnaces and a combination structural and rail mill have been completed and 60 by-product coke ovens are under construction. An officer of the company states that there are sufficient orders on hand, mostly from the Australian government, to keep the works running for 12 months. It is the intention to double the plant with as little delay as possible. The first heat from a 60-ton open-hearth furnace was tapped on April 8. The present plan is to make only soft stock for rods, rerolling billets (from 4 x 4 in. to 6 x 6 in. and 24 in. long) and blooms up to 10 x 10 in. and 10 ft. long. The rolling mill was to start rolling 100-lb. rails about May 6. Beams up to 100 lb. per yd. will be rolled later. The normal capacity when running full will be 50,000 to 60,000 tons per month. The present capacity is about 10,000 tons per month. Expert steel workers have been brought from Buffalo, Gary, Pittsburgh, Sparrows Point and other places under a three years' contract.

Magnetic Test of Steel Rails

The United States Bureau of Standards at Washington announces that each week's work furnishes further evidence that a magnetic test of steel rails is commercially feasible. The magnetic standards prepared five years ago are not sufficiently uniform to serve the purpose and new ones, free from this objection, are being prepared. Other work that the Bureau is doing is an examination of the screw box collar of a 14-in. gun which failed in proof firing as well as an investigation of the softening points of certain alloys used in piston packing. Such materials have been a source of much trouble because the melting ranges of bearing metals are only slightly above the steam temperatures in the engine cylinders.

The Flat Slab Patents Company, 332 South Michigan avenue, Chicago, has secured a decision from the United States Circuit Court of Appeals for the eighth judicial circuit sustaining the patent granted April 29, 1902, to Orlando W. Norcross for floorings for buildings. This patent is owned by the company and it is prepared to license those who desire to use flat slab reinforced concrete construction.

Improvements at Port Henry Iron Mines

A New Scheme of Mining and Hoisting by Which Mines Previously Distinct Are Now Operated as One

The Harmony ore body of Witherbee, Sherman & Co., Mineville, N. Y., was opened up in 1901. Two shafts, Harmony A and Harmony B, were sunk vertically for approximately 380 ft. to the ore body. After the ore was reached the two tracks of each shaft followed down the foot wall at an angle of about 38 deg. The encounter of dykes, particularly in Harmony A, running across the direction of the tracks and but a short distance from the foot of the vertical, necessitated a number of horizontal curves in the tracks as being the easiest method of overcoming the difficulty.

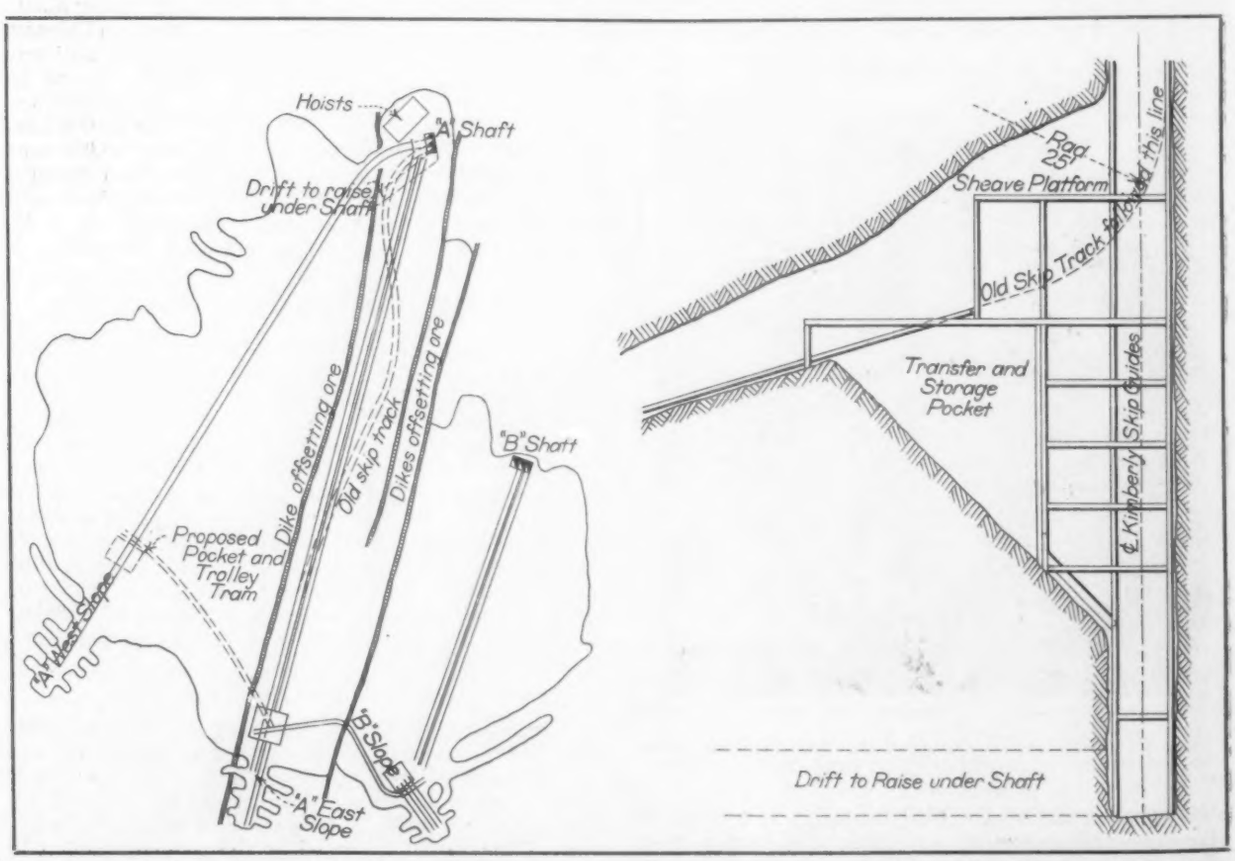
The tracks through the vertical shafts limited operations to the use of open-end skips, which, in order to be filled from the tram cars at the various levels on the slopes, necessitated "car holes" cut in the foot wall to receive the skips in a vertical position for loading. These car holes were bridged by hinged rails on the main skip tracks when the skips were not being loaded from the levels.

The combination of the short vertical and horizontal curves and the use of the "car holes" made fast hoisting impossible and even slow hoisting dangerous, as all the men had to be raised and lowered in the ordinary skips over these tracks. A four-drum electric hoist connected to one motor, one of the earliest of electric hoists used in mining in this country, further complicated the attainment of safety and speed. The hoist was designed to handle four 1½-ton skips, but as the depth increased, production could not be maintained with these small skips and four 3-ton skips were put on. The hoist, however, refused to handle more than three of these larger skips at one time, which caused further vexations and delays.

A AND B MINES JOINED

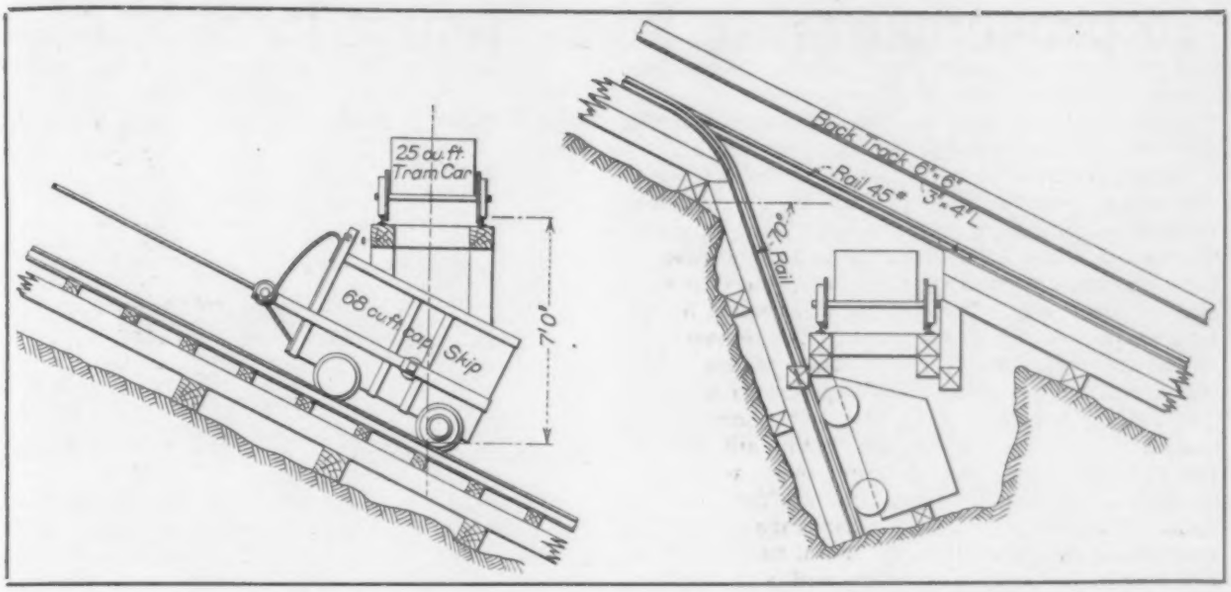
A break had occurred in the Harmony ore body between the location of the two shafts and as a consequence the B shaft ore lay about 90 ft. higher than the A shaft ore. The B body was worked by one main slope and the A body by two slopes, the west slope and the east slope, which came together at the foot of the vertical part of the shaft. There was no connection through from the A and B bodies except by a small ladderway. Consequently each was considered as a mine by itself, each having its own cost sheets, its own organization and accounts.

The timber in the vertical part of A shaft had reached a stage where it would have to be replaced. It was decided to take advantage of this delay and to change the entire scheme of working the Harmony ore body to one which would be as safe as could be effected and at the same time provide for handling the output for many years. The plan finally adopted was to work the two formerly distinct mines as one mine with three main slopes: the west slope, the east slope and the B slope, all of the ore from these slopes to be carried by open back skips into a pocket at the foot of the vertical of A shaft, and drawn from the pocket into a Kimberly skip operating through the vertical to the sur-



General Plan of Harmony Mine Showing Old and New Track Systems

700-Ton Storage Pocket Transfers Ore from Slopes to Shaft



New System of Loading by Open Back Skip

Old System of Loading by "Car Holes"

face. To accomplish the uniting of the two mines, a drift was to be driven connecting the east slope with the B slope.

Work upon this new scheme was begun in early November, 1913, and was completed by May 1, 1914. The four drums of the surface hoist were split. The original motor and two of the drums were retained for hoisting the 5-ton Kimberly skip and a three deck man cage in A shaft from the main pocket to the surface. Hoisting through B shaft was discontinued.

The A shaft house was raised 15 ft. to accommodate the larger skip and to provide a small pocket for storage of the ore over the crusher. The A shaft was retimbered and relined throughout as a three-compartment shaft with the partitions extending from the surface dump to the foot of the shaft. One compartment is used for the ore skip, one for the man cage and one for the ladderway, electric conduits and air and water pipes. From the foot of the shaft a level was driven to connect the shaft with the old workings and a large sump hole cut out, which will hold all the water made in the shaft for 48 hours, doing away with the necessity for Sunday pumping.

NEW POCKET AND HOISTING ROOM

A pocket at the foot of the vertical was cut out of the foot wall at the junction of the east and west slopes and contiguous to the vertical shaft, the ore feeding from the pocket directly into the 5-ton Kimberly skip in the shaft. This pocket will hold 700 tons of ore and is equipped with the air-operated gate and apron used throughout the Witherbee, Sherman & Co. mines for many years, which permits loading to be begun even before the skip comes to rest. The top of the pocket is timber covered and used as the main landing stage for men and supplies transferring from the man cage of the vertical to the man car on the slope.

At the level of the landing stage or top of the 700-ton pocket, a hoisting room was cut out of the side wall; and installed in it are the two hoists which operate the skips and man car on the east and west slopes from the bottom of the workings to the 700-ton pocket, an average haulage of 1400 ft. The main hoist operates two 3-ton open-back skips, one on the west and one on the east slope. It is a Nordberg, double drum, geared hoist, designed when operating at full depth to be driven by two 300-hp., 25-cycle, 440-volt, 500 r.p.m., induction motors of General Electric manufacture, but at the present depth is driven by only one of these motors. Motor connection is made through flexible couplings on the main shaft to pinions mounted on each side of the main drum shaft gears. The gears are of cast steel herringbone type of Wuest manufacture. The pinions are of forged steel, forged in one with the shaft. Drums are cast iron, cylindrical, clutched to the shaft, grooved for 1-in. rope, with capacity for 3000 ft. of it, 7 ft. in diameter by 3 ft. face. Brakes are of Post type, actuated by dead weight released by hand wheel. Clutches are hand operated, of Nordberg axial friction type. The safety device is of the lead screw and nut type controlling the lever of water rheostat, shutting off the current and applying a dead weight against the brakes. The hoisting speed is 1200 ft. per minute, out of balance with load of 26,400 lb. on a 40-deg. incline.

The other hoist operates the man car over one of the double tracks of the east slope and is a Lidgerwood single drum hoist, gear driven by a General Electric motor of 52 hp., 440 volts, 25 cycles.

The old tracks on the east and west slopes were straightened and run at a fixed grade from the top of the 700-ton pocket to the bottom of the slopes. The east slope was double tracked, one track for the ore skip, the other for the man car. The B slope tracks from the level leading to the east slope were changed from their old direction to one more nearly at right angles to the strike of the ore body. All trestles, as far as practicable, were filled with rock and a solid road bed secured for all tracks.

CONNECTION WITH B SLOPE—A 200-TON POCKET

At the 380-ft. level on the east slope, the level connecting through with the B slope was driven. This connection is 140 ft. by 8 ft. by 10 ft. A 5-ton General Electric Company 220-volt, single pole locomotive hauls two side-dump, gable-bottom cars of 3 tons capacity from a pocket on the B slope through this drift and delivers the ore into a 200-ton pocket. This pocket is built directly over the east slope tracks. Concrete foundation walls were put in parallel to the tracks and far enough from the outside rails to give good clearance for the skip and man cage. These foundations extend from the face of the pocket back up the slope to the level at which the ore is brought into the dump for the

pocket, at a hight to give 7 ft. clearance between the rail and the bottom timbers of the pocket. The tops of these two walls were stepped off in 20-in. vertical by 30-in. horizontal steps which form the footing for six 10 x 10-in. timbers bolted together and tied into the foundation walls, forming a 20 by 30-in. girder which carries the weight of the ore in the pocket over the tracks. Rock fill outside these foundations extending to the track pillars completes the floor and the back of the pocket. The sides of the pocket are formed by the track pillars on each side of the tracks. The face is constructed by extending the bottom 20 by 30-in. girder on each side of the foundation walls into the track pillars, forming a sill for the support of the vertical timbers. The vertical timbers of 10 by 10-in. Georgia pine spaced 5 ft. 10 in. centers rest on this sill and are tied into the roof, and at about every seven feet of their hight are tied back into the foot wall by means of old cable. These vertical timbers form the bracing for the 10 by 10-in. horizontal timbers which are spaced 5 ft. 10 in. centers and are tied into the track pillars. The whole face of the pocket is further braced by means of old cable stretched taut across the front at different hights and anchored in the track pillars. Face lining is of 3-in. plank from the top of the pocket to the bottom. The top of this pocket is floored over and carries the electric locomotive tracks into the dump and also serves as a landing stage for transferring men and material from the main car on the east slope and destined for the B slope or the west slope.

Before this new system was completed the present depression in the iron industry of the country had set in and since then the Harmony mines have been working part time only, so that an actual comparison of costs of operation has not been possible. The largest tonnage hoisted under the new system is 1300 tons in eight hours, which, under the old system, would have required four 8-hour shifts.

A NEW CONCRETE PILLAR

A few months after the completion of the new system described above a large shaft pillar on the east slope which was traversed by a dyke began to scale off and open up on the dyke. It was decided to put in a concrete pillar leaving the old pillar as a core. Old cable was wound round the old pillar from top to bottom, forms were erected, reinforced with cable wound spirally, and the concrete poured from a mixer which was set on the foot wall considerably above the pillar. The impact from this fall made a good tight bond of the pillar and the roof. The pillar when completed contained 1284 cu. yd. of concrete at a total cost of $6.72 per cu. yd.

OLD BED MINES

The company sunk two new winzes through rock in its Old Bed mines in 1914. These will bring the ore from the continuation of the Old Bed body into the foot of the present Joker shaft, at approximately 900 ft. from the surface. The winzes are 8 by 20 ft. and of three compartments, 8 by 20 ft. One winze is sunk at an angle of 24 deg. 15 min., striking the ore at 1000 ft. The other is at an angle of 33 deg., striking the ore at 700 ft. They are each equipped with a 300-hp. Nordberg hoist, as described above, and discharge into pockets at the foot of the present Joker shaft. Three other slopes on this same body of ore were continued during the year, all delivering to the foot of the Joker shaft so that from now on the Old Bed body will be worked by five main slopes, delivering to pockets on the Joker shaft. Hoisting through the other shaft, the Bonanza, on this body will be discontinued and the shaft will be used for ladderways, electric cables and air and water pipes.

The underground development work accomplished during 1914 in Witherbee, Sherman & Co.'s mines, exclusive of the two new winzes in the Old Bed, is as follows:

Mine	Winze and sinks, ft.	Raises, ft.	Drifts, ft.	Total, ft.
Old Bed	1,058	442	2,364	3,864
Harmony	389	...	2,729	3,118
Barton Hill*	62	...	353	415
Sherman†	130	...	not measured	130
Totals	1,639	442	5,446	7,527

*Closed down March 1, 1914.
†Closed down June 1, 1914.

Reclaiming Nickel Anodes by Welding

In the plating department of the Prest-O-Lite Company, Inc., Indianapolis, Ind., worn nickel anodes which have previously been scrapped and sold at less than half price are now being reclaimed by the welding process. Heretofore the method of utilizing the scrap nickel anodes has been to drill holes through several pieces and bind them together with lead rivets.

Scrap Nickel Anodes That Have Been Reclaimed and Made Fit for Further Service by Autogenous Welding

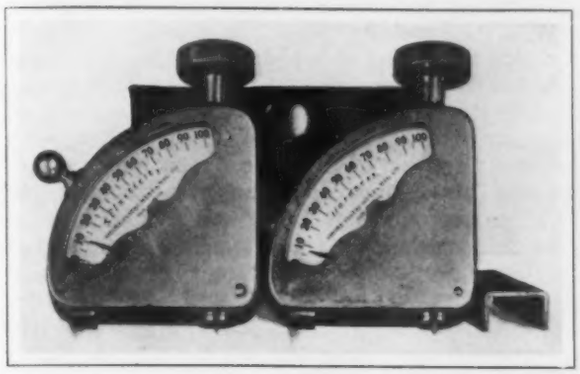
In doing this work the anodes, after being partially eaten away by the solution, are turned over to an autogenous welder who increases the surface by welding on one or more pieces of scrap. The number used depends on the size and weight of anodes desired and in some cases as many as four pieces have been welded together. At the same time the brass hooks which are employed to support the anodes in the plating solution are removed, the solder melting away under the heat of the oxy-acetylene flame which is approximately 6300 deg. F.

The anodes used by this company are elliptical bar castings, approximately 1½ x 3½ in. in section and 30 in. long. The weight is in the neighborhood of 30 lb. and on the basis of 50 cents per lb. each anode has a market value of $15. The old anodes have a junk value of 22 and 25 cents per lb., and in a recent experiment 421 lb. of scrap anodes was reclaimed at a cost of material and labor of $24.86 or less than 6 cents per lb.

The Hoover Steel Ball Company, Ann Arbor, Mich., is breaking ground for an additional building, 40 x 313 ft., to be fitted with ball-making machinery. This will make the third new building which the company has erected since September 1, last year, and comprising over 29,000 sq. ft. of floor space. All these buildings are exclusively equipped with machinery for making the new micro-chrome ball which the company put on the market January 1. Orders for this grade of ball have far exceeded expectations. Contracts have been placed for approximately $65,000 worth of additional ball-making machinery, which is entirely special.

Measuring the Hardness of Rubber

The Shore Instrument & Mfg. Company, 555 West Twenty-second street, New York City, has brought out two instruments designed for measuring the hardness and elasticity of rubber and other pliable materials. The first of these, which is known as the Durometer, measures the hardness in



Two Recently Developed Instruments for Measuring the Elasticity and Hardness of Rubber and Other Pliable Materials

terms of resistance to the depression of a plane surface by a standard spring pressing on a blunt pin. The surface is not broken and the instrument is thus adaptable to finished articles. The second, the Elastometer, measures elasticity in terms of resistance to permanent deformation or tearing. In the accompanying illustration the Elastometer is shown at the left and the Durometer at the right. Both instruments are designed for free hand use, but it is emphasized that better results will be secured if an operating stand is used in connection with them.

In using the Elastometer, the knob projecting on the curved side is pushed down gently as far as it will go easily. This locks the penetrating pin shown under the instrument before the test is made. After the pin is locked, the instrument is applied to the surface of the material being tested with sufficient pressure to insure full penetration and perfect contact with the stop boss from which the pin protrudes. After an interval of about 5 sec., the locking knob is slowly raised, thus unlocking the penetrating pin and releasing the indicating hand so that it will rise in proportion to the amount of elasticity possessed by the material. As the sensitive pin is required to penetrate its full length in all material, it is pointed out that that the instrument must be held steady to avoid undue friction on its surface. It is recommended that several tests be made and an average value taken.

The Durometer measures hardness by indenting the surface under pressure of a blunt pin or the resistance to penetration. If the material under test has this tendency to take a permanent set, the indicating hand will gradually move backward after the first second of application. The amount of permanent set thus indicated per second or per minute is important in determining the amount of viscosity in gum and similar substances, or the readjustment and friction of the particles of compositions under pressure. When the instrument is being used free hand, it is recommended that it be held steady and as nearly vertical as possible.

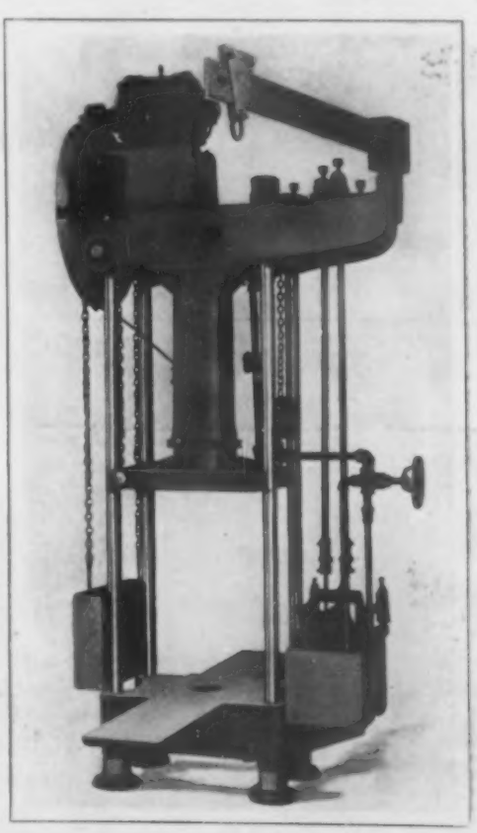
The Wagner Electric Mfg. Company, St. Louis, announces the opening of an office in the Walker Bank Building, Salt Lake City. The office will be in charge of F. C. Morton, who for many years has been identified with the sale of electrical apparatus in that territory.

A 60-Ton Hydraulic Forcing Press

The Hydraulic Press Mfg. Company, Mt. Gilead, Ohio, has brought out a new type of inverted hydraulic forcing press for general work in machine, railroad, automobile and repair shops. It is a self-contained unit, requiring no auxiliary water or power supply and is driven by an electric motor which is mounted on the top of the machine. A hoist suspended from a swinging crane and trolley device provided at the head of the press enables material to be lifted into place. The inverted type construction brings the base or platen of the press close to the floor which tends toward convenience in putting heavy material into the press and detachable extension shelves measuring 12 x 30 in. are fastened to each side of the press for the reception of material.

Steel is used for the important parts of the press such as the strain rods, the pressure base and the cylinder. Cold rolled steel shafts are used for the strain rods, while the pressure base is a steel casting and the cylinder is made from another one. The pressing surface of the lower platen of the press measures 22 x 24 in. and there is a hole in the center 6 in. in diameter to take the end of the hub or shaft during the pressing operation. The movable platen which is the same size as the lower one is guided in its travel by babbitted bearings on the strain rods. A weight returns the ram after the pressing operation.

The press illustrated is equipped with a two-plunger vertical hydraulic pump, the plungers being $\frac{5}{8}$ in. in diameter and having a stroke of $3\frac{1}{2}$ in. A 3-hp. motor mounted on the press drives the pump through two eccentrics, the gears being entirely inclosed. If desired belt drive can be substituted for motor drive for the press. An automatic knock-out valve attachment, spring safety and T operating valves and a pressure gauge are included in the equipment of the pump.



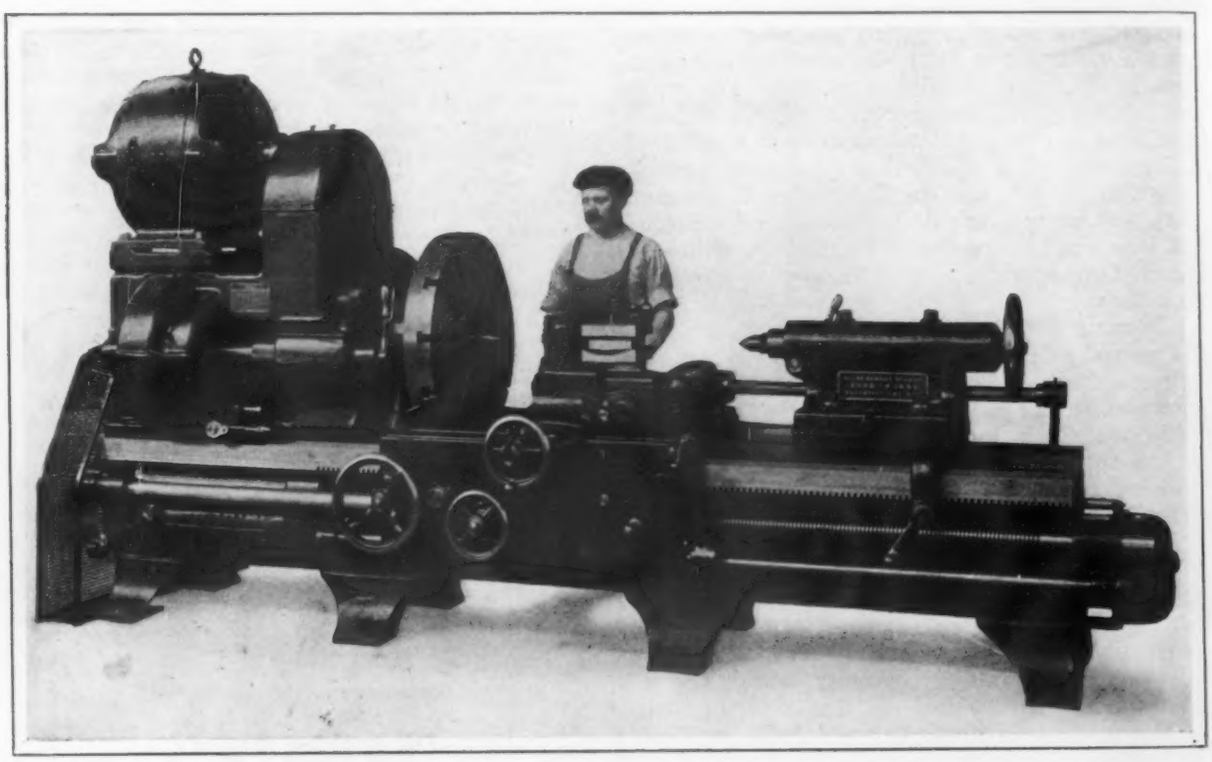
A New Design of Inverted Hydraulic Forcing Press Which Is Self-Contained and Capable of Exerting a Pressure of 60 Tons

SHELL WORK ENGINE LATHES

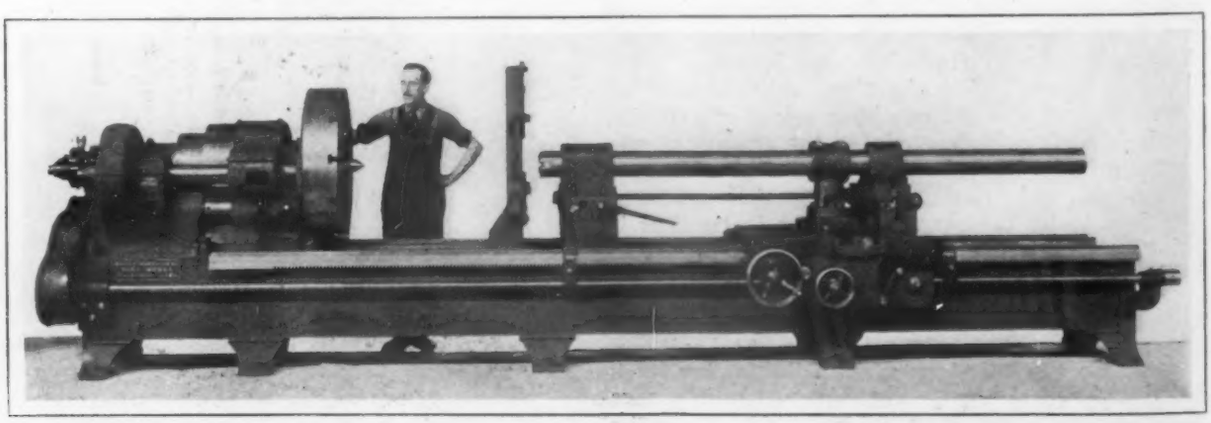
A Group of Three Standard Machine Tools Equipped with Special Attachments

To increase the efficiency of the standard engine lathe when operating on shell work the Niles-Bement-Pond Company has developed a number of special attachments. These are designed to adapt the machines for the rapid production of duplicate work in the finishing of shrapnel and all sizes of high explosive shells, both of the solid and hollow forged types. Among the attachments that have been designed for this work are a boring tailstock, a boring bar mounted on the lathe carriage and arranged for either straight or taper boring and another attachment for cutting waves and grooving the band seats of shells. All of the attachments can be removed easily at any time if so desired and replaced with standard parts, thus rendering the machine available for regular engine lathe work.

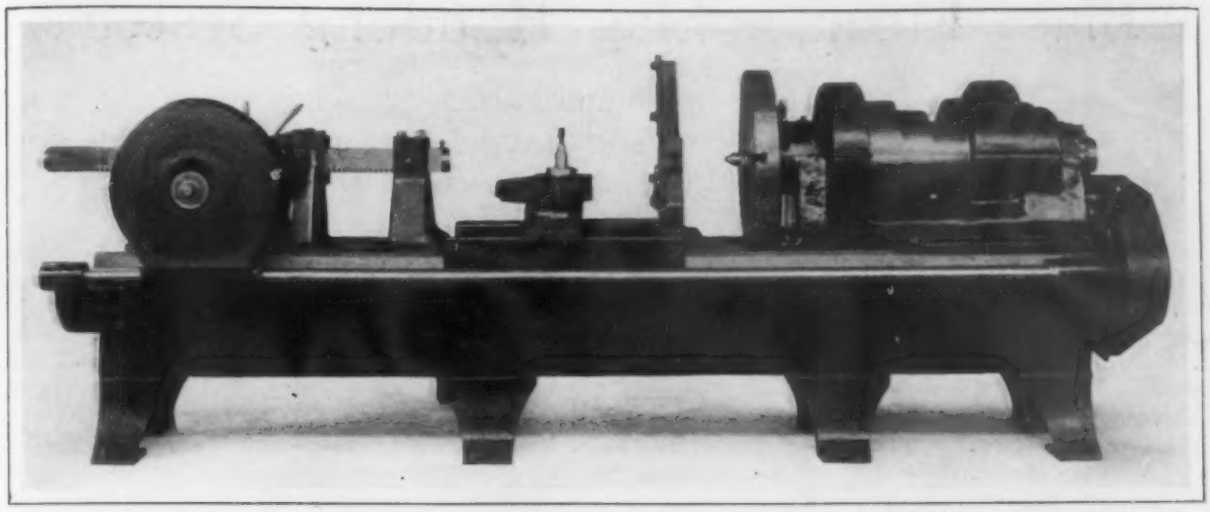
The boring tailstock illustrated in one of the accompanying engravings is designed for boring high explosive shells either from solid billets or hollow forgings. It is shown fitted to a 26-in. double back-geared engine lathe and is the only special feature about the machine. The tailstock is fitted with a square forged steel boring ram having power feed by a shaft geared to the headstock and running along the rear of the bed. Motion from this shaft is transmitted through a worm and worm wheel to the pinion meshing with the rack on the ram and is relied upon to give a smooth, positive motion. Large pilot wheels provide for traversing the ram by hand and for starting and stopping the feed. The interior contour of the shell is obtained by using bottoming and forming tools built to suit the particular requirements of individual cases. To prevent vibration of the tools the boring ram has a support that is capable of adjustment along the bed to a position adjacent to the work. Quick change gear feed mechanism and a standard tool carriage, the latter for turning operations, are included in the equipment of the lathe, as well as a steady rest for supporting either a pot chuck or the shell itself as circumstances may require. Both the boring tailstock and its support can be readily removed if necessary and a standard tailstock applied.



A 30-In. Lathe with an Attachment for Cutting the Waves and Grooving the Band Seats of Shells. A reciprocating motion of the tool slide, parallel to the bed, which is secured from the main spindle through gears, shafts and an eccentric, gives the wave effect



A 36-In. Triple Geared Lathe Arranged for Straight or Taper Boring Having a Boring Bar with Bearings on Each Side of the Carriage and Capable of Movement Across the Lathe if Desired



Rear View of a 26-In. Double Back Geared Lathe Equipped with a Special Tailstock for Boring High Explosive Shells. The boring ram of the tailstock has power feed from the headstock through the shaft running along the rear of the bed

The boring bar for straight or taper boring of shells is carried in a bearing having a swiveling base mounted in the carriage. Two supports consisting of a bearing for the bar mounted on a slide which has cross adjustment on a substantial base are provided, one on either side of the carriage. When taper boring is to be done the support near the shell is shifted to one side of its central position and the other one shifted in the opposite direction, the support bearings having means for swiveling a sufficient amount. The central bearing of the bar is arranged to slide in and out on the carriage as the bar is fed along the lathe. If desired the bar can be adjusted bodily across the lathe to enable the cutter to be traversed inside the shell and fed into the work, while it always remains at the given set taper. This is secured by having the slides of the two end supports connected by screws and gearing to move simultaneously when adjusted by the ratchet wrench shown on the support adjacent to the headstock.

In equipping the 30-in. back-geared lathe with an attachment for cutting the waves and grooving the band seats of shells, a special rest has been substituted for the standard compound tool rest which has been removed from the carriage. The special rest consists of a lower slide mounted directly in the carriage, having a cross adjustment by a hand screw and supporting a tool slide. To obtain the wave effect this tool slide is given a reciprocating motion parallel with the bed while the projectile revolves. An eccentric carried on a cross shaft which is journaled in the cross slide and is driven by bevel gears from a shaft located along the back of the lathe provides this motion. The latter shaft is geared to the main spindle of the headstock and the number of waves per revolution required on different sizes and types of shells is secured by using change gears, the desired amount of wave being regulated by an adjustment of the eccentric while the depth of the wave rib is determined by the shape of the formed tool.

A four-sided turret tool post is furnished on the rear of the carriage with this attachment. In this way all the operations on the band seat can be performed at a single setting of the projectile in the lathe.

The American Mining Congress is to hold its eighteenth annual session at the Exposition Memorial Auditorium, San Francisco, Cal., September 20, 21 and 22. J. F. Callbreath, Majestic Building, Denver, Colo., is secretary.

Bethlehem Steel Company Improvements

The large war contracts which are so fully engaging certain departments of the Bethlehem Steel Company's operations have directed attention prominently to recent announcements concerning the programme of new construction which is being carried out at South Bethlehem. Much of the work referred to lately in the daily press is a part of that outlined in *The Iron Age* of January 7, 1915, when details were given of large additions on which work was in progress when the European war broke out, but later was suspended altogether. The 10-in. merchant mill, which has been prominently mentioned, was part of the original programme. The special interest in it now is due to the fact that the company is starting it up.

Mention has been made in the dispatches of the week of the starting up of a new blast furnace at South Bethlehem. This is furnace F which has been out for some time for relining and repairs. At the same time furnace B was blown out preparatory to dismantling. This is a small furnace and at some time in the future it will be replaced by a larger furnace of modern type, similar to the other furnaces the Bethlehem Steel Company has built in the past half dozen years.

New Plant for Alloy Steel Tubes

The Ohio Seamless Tube Company, Shelby, Ohio, has started the erection of a new plant, to be equipped with machinery for the producing of seamless tubes from high carbon, high chrome steel for ball and roller bearings and other special purposes, also for the manufacture of seamless tubes from various alloy steels for special purposes. The estimated cost of the plant and equipment is $350,000 to $400,000.

The Continental Can Company, the largest competitor of the American Can Company, has two regular packers' can and one general line factory in Chicago, a machine shop and a packers' and sanitary can factory in Syracuse, N. Y., a packers' and sanitary can plant in Baltimore, a general line factory in New York, and a sanitary can plant in Canonsburg, Pa., besides a large tin-plate mill at the last-named point. All its special machinery is made at the machine shop in Syracuse.

The J. W. Paxson Company, foundry supplies and equipment, 1021 North Delaware avenue, Philadelphia, Pa., has an interesting record in the business department of *The Iron Age*. The company placed its first advertisement in the paper on March 17, 1876, and it has been running continuously to the present time.

Work will be started shortly on extensions to the plant of the Canton Sheet Steel Company, Canton, Ohio. Eight new hot mills will be installed.

Blast Furnace Slag Handling System

Breaking Up the Hardened Material with a Crane and Chains Preparatory to Utilizing It Commercially

BY F. L. PRENTISS

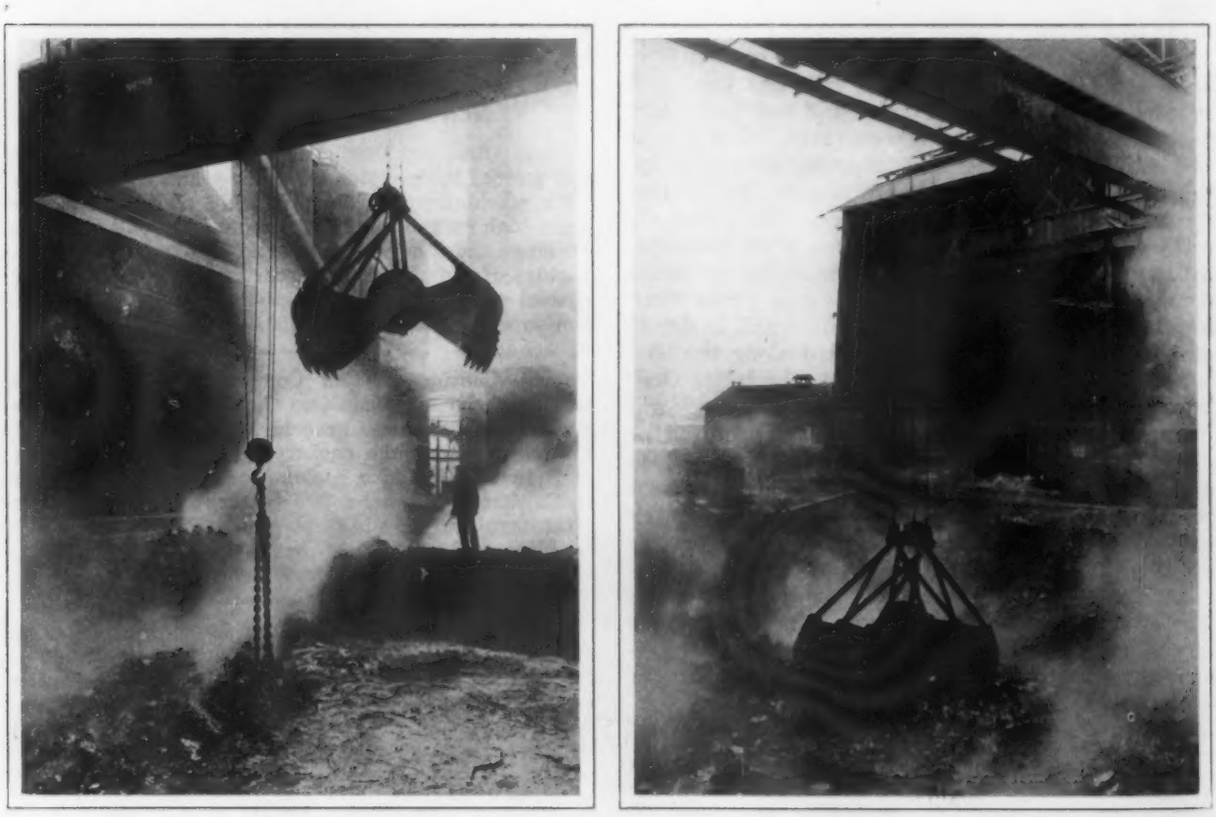
The commercial use of blast furnace slag has increased materially during the past few years and slag is becoming more and more a valuable by-product of a furnace instead of a useless refuse involving an expense to secure its removal. The handling and disposal of slag has always been a difficult problem but an important present-day question with blast furnace managers is the best way to handle the material so that a market can be made for it. At many of the older blast furnaces large banks of slag have been allowed to accumulate and owing to the increased commercial demand, these are now being dug up, crushed and sold for various commercial purposes.

Going back more than two score years for comparison, there were two methods quite generally employed for handling slag in the 80's. One method was casting it from the furnace into either end or side dump ladle cars and often into cars with sloping sides, the liquid slag being drawn off by tapping a hole in the side. Then the sides were lifted with a crane and the bottom of the car was tilted so that the skull would tip or fall off. These cars, as well as the side and end dumping ladles were small, expensive to operate and maintain and often ran on narrow gauge tracks. The other method was to lead the slag into long runners made by a long-handled shovel dragged backward through the sand. These runners were often in two or three parallel lines and sometimes nearly 100 ft. in length. When cold these runners were broken by pulling them up with iron hooks and the pieces were forked into cars and the slag was given to the railroads for use in construction, fills and ballast.

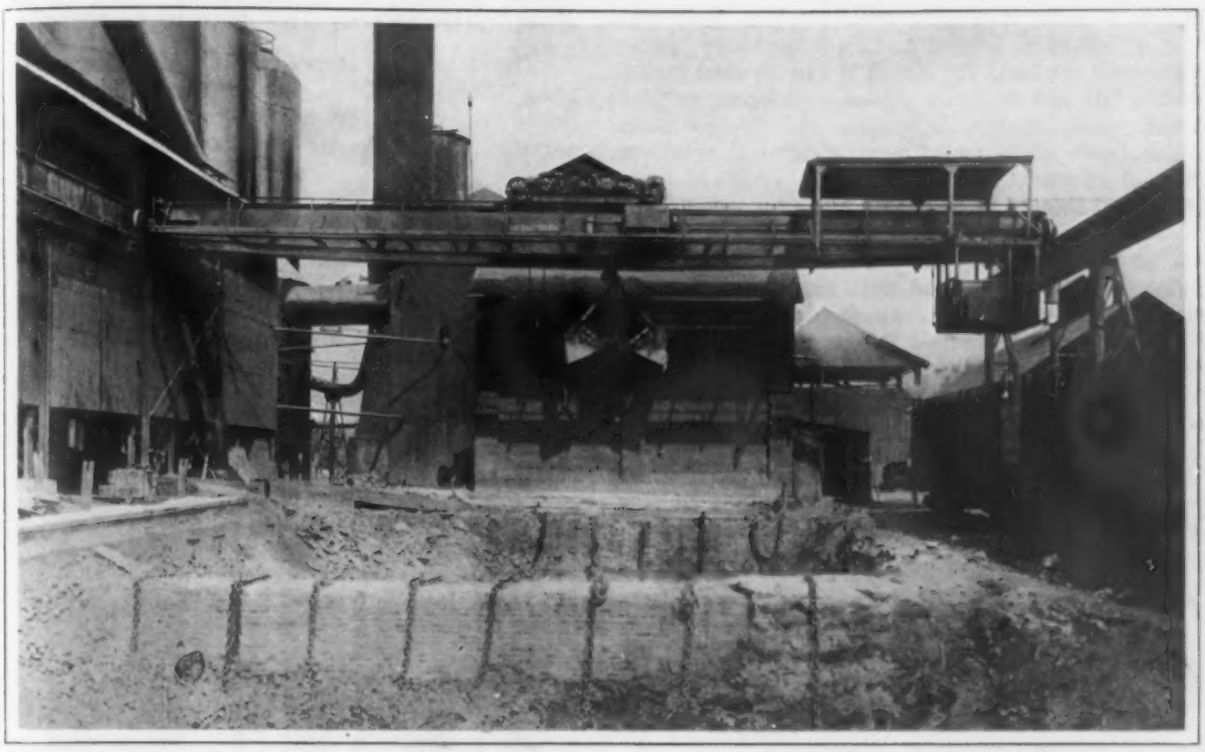
The most radical early improvement in handling slag resulted from the mechanical development of quick-dumping ladles of large capacity and standard gauge, but where land was too expensive for dumps, the granulating pit came in use, provided the railroads would take the slag. This method consisted of running molten slag into a pit of water, the stream of molten slag often being flushed by a stream of water of large volume flowing in the same direction. This caused the slag to boil up into a light fluffy mass and often to separate as a very light sand known as granulated slag. The great disadvantage of this method was the steam and fine granulated sand which blew around the plant near the pit. Another disadvantage of this method is that after the slag is granulated its volume is almost doubled. It is very light and contains 15 to 20 per cent. of water.

The railroads have been taking large quantities of this granulated slag, but now that they are beginning to demand as high as 20 to 35 cents a ton for hauling it away, some of the advantages that resulted from transforming the slag into a granulated form appear to have disappeared. It is further stated that this granulated slag has no value except for cement making and the demand for it for that purpose is limited to special locations and to slag of peculiar analysis.

Various designs of endless conveyors, pans, buckets, etc., have been tried for handling slag and



Two Views of the Crane in Action. At the left a chain has been pulled out of the slag bed and the grab bucket is ready to descend, while at the right the bucket is digging up a load of slag



The Special Slag Handling Crane Installed at the Plant of the Punxsutawney Furnace Company. It is equipped with auxiliary hoisting mechanism and bottom block for laying the chains shown in the foreground and pulling them to break the slag for commercial use and a 1½-yd. bucket for loading the broken material on cars

abandoned because of the excessive cost, wear and tear or for other reasons. Another method has been to cast the slag into large chunks which are handled with cranes and grappling hooks, but the material in this form after it is placed on cars is unwieldly and valueless. It is also expensive to unload and is not cheap to handle from the furnace yard to the cars. Several years ago a plant was developed consisting of a set of beds located high enough to discharge directly on a railroad car. Slag was run into these beds from the furnace and allowed to cool in slabs 40 ft. long, 8 ft. wide and usually 4 to 6 in. thick. A plow pulled by chains slid the slab off the end and a rotating hammer broke it into small pieces, discharging it on the car. This method worked satisfactorily for a number of years.

A new method of handling slag has recently been developed by D. T. Croxton, president of the Cleveland Furnace Company, Cleveland, Ohio, this being known as the Croxton patented chain system. This system is to have two beds, each approximating an area equal to 30 x 40 ft. or more. Across the bottom of one bed heavy chains are laid in parallel lines about 30 in. apart, with the ends extending up and out of the bed. Slag as made, or at the convenience of the furnace operator, is run over the chains, tending to level itself, and forming layers of varying thickness, depending on the quantity of the slag in each run and the size desired for the market. At the end of 24 hr. or more that bed will be covered to a thickness of 30 or 40 in. in 2 or 3 in. layers. A crane which moves over the beds pulls the chains up through the slag, breaking the latter up like ordinary soft coal and leaving very few large lumps. The chains are then laid in the bottom of the other bed, into which slag is run for the next 24 hr.

While the second bed is being filled a grab bucket on the crane digs out the broken slag in the first bed and conveys it to a car or puts it directly into a crusher where it is crushed, screened and delivered to bins properly sized for the market.

The Croxton chain system has been adopted by the Punxsutawney Furnace Company, Punxsutawney, Pa., the special type of crane used for handling the slag at this plant having been described and illustrated in *The Iron Age*, April 29, 1915. The Croxton system is now being installed in connection with a slag handling and crushing plant that is being installed for the Perry Iron Company, Erie, Pa., by Arthur G. McKee, contracting engineer, Cleveland, Ohio.

The advantages claimed for the Croxton chain system for handling slag include a minimum of labor and a minimum of steam and dirt flying around the plant, a large reduction in the railroad switching charges for handling and the turning out of this by-product in a form in which a market can be found for it in almost any locality. The low cost of handling the slag by this method is indicated by the statement that a 2-ton bucket making a trip every minute requires only 1 hr. 40 min. to load on to cars the 24-hr. slag production of a large blast furnace, the slag output of the largest furnace being a little more than 200 tons per day. In considering safety first of the employees the system eliminates large ladles of molten slag which frequently explode or upset burning workmen, and the granulating pit of boiling water which has resulted in many fatal accidents is done away with.

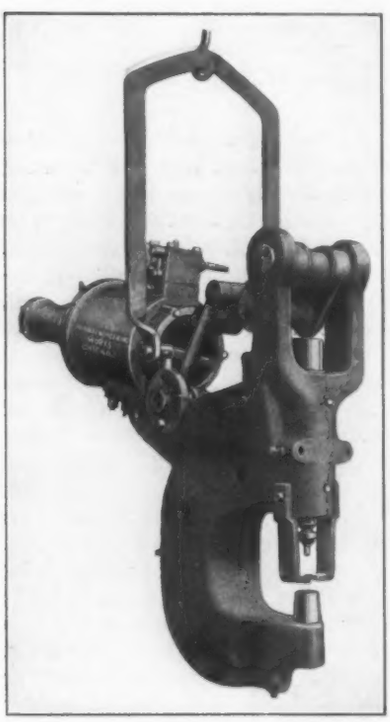
It is believed that the acceptance of slag as an aggregate for concrete by many of the best engineers and city building codes is sufficient evidence to guarantee its future. It is claimed to be more desirable than stone in concrete for construction purposes because of its lighter weight and greater strength and its usually lower cost. Slag is now used in road building, macadamizing and for ballast for steam and trolley railroads. Concrete is being used in some places in preference to brick for country roads, and it is stated that slag concrete is a favored material for this purpose. Where a brick surface is desired, 10 per cent. of slag concrete is used for the foundation. Slag sand, or screenings and slag concrete are used in fireproofing floors, and another purpose for which it is said to be unex-

celled is as a roofing gravel. It has been used in making brick by the so-called sand-lime process and other products for which it can be used include hollow tile and building blocks, reinforced or plain sewer pipe, drains, telephone and trolley poles, piles, fence posts, reinforced structural members, etc., all of which can be made with standard forms in a plant located at or near a blast furnace.

With a power plant for crushing, screening and sizing, combined with the Croxton chain system and hammer mill, it is stated that slag in all sizes, including sand or powder, can be produced at such a low cost that a wide field is open for it. It is also stated that by passing the slag after it is crushed over a magnetic separator probably 2½ per cent. of iron will be recovered in a finely divided state which is usually wasted in the dumps or granulating pits. It is claimed that the slag from a blast furnace located in a well populated district ought to yield a return of from $10,000 to $30,000 a year.

A Yoke Riveting and Punching Machine

A combination yoke riveting and punching machine has been recently placed on the market by the Hanna Engineering Works, 2059 Elston avenue, Chicago, Ill. The riveting machine is the same in its general construction as 100-ton lever and toggle machine which was illustrated in *The Iron Age*, April 8, 1915. An auxiliary dashpot mechanism has been added, however, and is relied upon to absorb all the shock when the die has passed through the plate in punching. One of the special fields for which this machine is adapted is the punching of bent channels, it being particularly emphasized that in doing this work a considerable saving in time and labor will be effected over the usual method of routing this work through the shop.



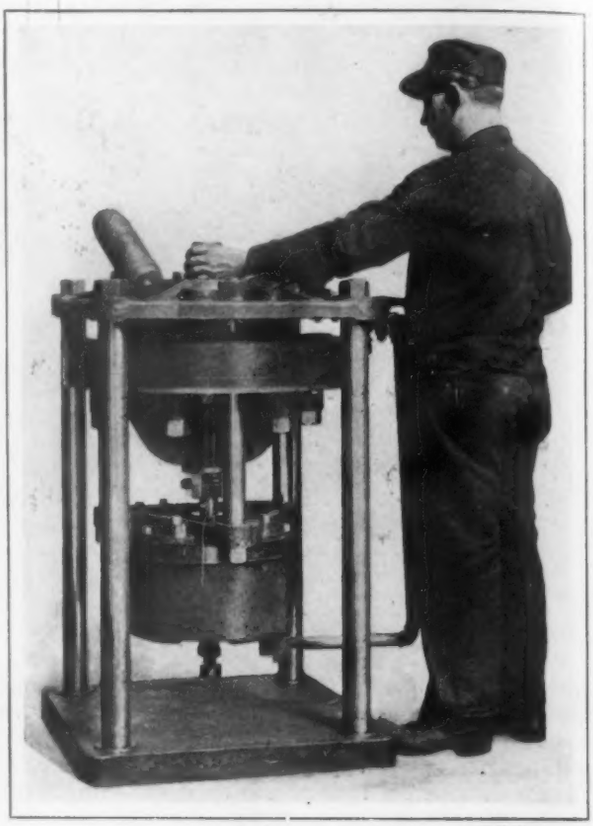
A Recently Developed Combination Yoke Riveting and Punching Machine with an Auxiliary Dashpot Mechanism to Absorb the Shock of Punching

Coke-Oven Accidents

In the two-year period of 1913 and 1914, according to a report soon to be issued by the United States Bureau of Mines on coke-oven accidents in this country, 96 men were killed, 644 seriously injured and 4059 slightly injured. The death rate for each 1000 employed was 1.89 in 1913 and 2.02 in 1914. The report includes the returns from 275 active plants in 1913 and 253 in 1914. The report states that "since 37 per cent. of the fatalities at coke ovens is due to haulage systems, greater care and precaution should be taken to safeguard the employees who operate or work adjacent to transportation equipment."

Pneumatic Press for Banding Shrapnel

The Motch & Merryweather Machinery Company, Cleveland, Ohio, has recently brought out a pneumatic press for use in the manufacture of shrapnel. It is intended for compressing the copper bands on the shells, the dies first striking a sharp blow and subsequently exerting sufficient pressure to force the copper into the dovetail groove thus produced.



A Recently Developed Press for Pneumatically Compressing the Copper Bands on Shells

The press is self-contained and operates on an air pressure of 100 lb. that is secured from the shop compressed air system by making a connection with the control valve of the machine. This is the only work required to put the press in operation. The shells when placed in the steel head of the press are forced upward by the air pressure in the cylinder against adjustable stops, this action closing in the dies to make the groove and seat the band by the action of a set of heat-treated steel toggles.

The machine requires a space 30 in. square on the floor and weighs 1750 lb. It is capable of handling shells up to a maximum diameter of 4½ in. A band has been placed in actual operation on an 18-lb. shrapnel shell, which is 3.3 in. in diameter, in 7 to 8 sec. This rate enables one operator to turn out a shell every minute, while if two operators are employed the rate is between 3 and 4 shells in that length of time.

A by-product coke-oven plant will be erected by Pickands, Mather & Co., Cleveland, in connection with the blast furnaces of the Toledo Furnace Company, Toledo, Ohio. Plans provide for the erection of 94 coke ovens with a total capacity of 1000 tons per day, or sufficient to supply coke for the company's two blast furnaces. It is the intention to provide a plant as up to date as can be secured. The contract for the ovens will be placed with the H. Koppers Company, Pittsburgh.

Change in Volume and Shape By Hardening

How Various Grades of Steel Are Altered by Different Heat-Treating Methods and Mediums as Determined by Extensive German Experiments

No thorough investigation has been made of the changes in volume and shape that take place in steel with hardening, although it is a subject of great practical importance and of considerable scientific interest. The recent publication of a dissertation on this subject is therefore of interest, and a full extract is given in the Zeitschrift of the Vereines deutscher Ingenieure, January 23 and February 6, 1915, from which the following is taken. The author is E. H. Schulz, doctor of engineering, and the work was done at Charlottenburg.

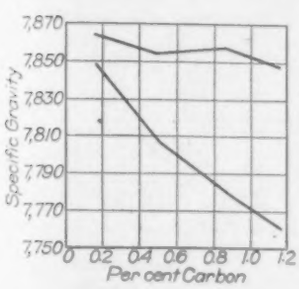


Fig. 1—Specific Gravity of Carbon Steels in Annealed and Quenched Conditions

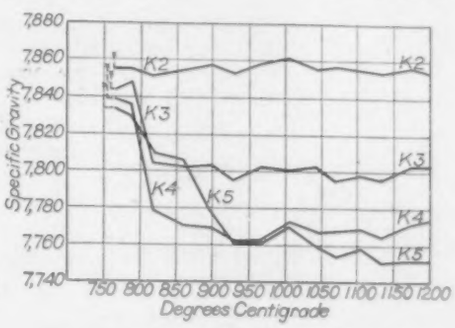


Fig. 2—Specific Gravity of Carbon Steels After Quenching at Different Temperatures

The analyses of the steels used in the investigation are given in Table 1.

They were from Krupps, the Baildon Hütte and the Krefelder Stahlwerk. Specific weight determinations were made at 18 deg. C., and the limits of error, with samples weighing about 22 grams, are not believed to be more or less than 0.002 of the values. During the various heat treatments special care was taken to avoid decarbonizing, and the various temperatures were determined either with the LeChatelier pyrometer or a mercury thermometer.

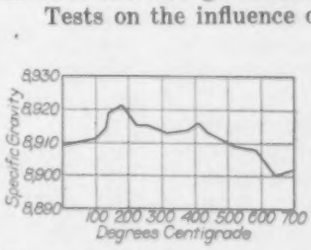
The first series of tests on plain carbon steel samples K2, K3 and K4 and K5 were to find the change in volume brought about by simple quenching on the annealed steels, and the effect of the quenching temperature and quenching medium. The specific gravity of samples heated to 1000 deg. C. for a short time and slowly cooled, also of samples quenched in water at 18 deg. C. from 1070 deg. C., is given in Table 2 and shown in diagram form in Fig. 1.

It is seen that the specific gravity decreases as the carbon rises. This decrease is not regular, but shows a bend in the curve at about 0.5 per cent. carbon, as previously noticed by Benedicks. This is not seen in the quenched steels. Through quenching the specific gravity decreases, the amount increasing with the carbon. The change in volume with quenching is therefore dependent on the carbon, and is also connected with the internal changes taking place during quenching.

Tests were then made with the same steels under the same conditions, on quenching from different temperatures. The results are given in Table 3 and Fig. 2. The small crosses in the diagram give the specific gravity of the steel as annealed.

It is seen that above a certain temperature limit, between about 800 and 900 deg. C., increasing with the carbon, the quenching temperature does not exert a marked influence. Below this limit the volume increases quickly with a rising quenching temperature. This may be due to quenching above this limit, causing such quick cooling through the transformation range that the martensite is retained unchanged, while lower temperatures allow more or less change of the martensite to take place.

Tests on the influence of the quenching medium were carried out with water and oil on steels K2 to K5 and B, from a temperature of 900 deg. C. The results are shown in Table 4.



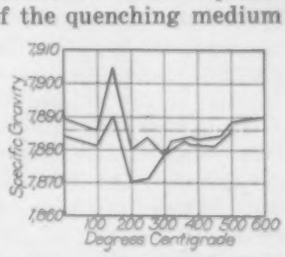


Fig. 3 (Left)—Specific Gravity of Pure Copper, Quenched at 950 Deg. C. and then Tempered. Fig. 4 (Right)—Results with Pure Electrolytic Iron

Apart from steel K2 with very low carbon, quenching in oil gives in general a smaller increase in volume than quenching in water. The difference is greatest with the eutectoid steel K4; in both the

Table 1.—Analyses of steels used

Kind of Steel	Mark	Car.	Mang.	Sul.	Phos.	Sil.	Cu.	Cr.	Ni.
Carbon	K2	0.16	0.38	0.015	0.017	0.33	0.07	....	....
Carbon	K3	0.51	0.62	0.023	0.045	0.33	0.07	....	....
Carbon	K4	0.86	0.25	0.033	0.01	0.23	0.02	....	....
Carbon	K5	1.17	0.31	0.02	0.01	0.22	Trace	....	....
Carbon	B	1.10	0.24	0.01	0.02	0.24	0.01	....	....
Carbon	M	0.65	0.60	0.02	0.015	0.21	0.017	....	....
Nickel	N8	0.09	0.38	0.03	0.015	0.18	0.08	....	4.12
Nickel	N9	0.31	0.29	0.03	0.02	0.15	0.06	....	3.16
Nickel	N0	0.37	0.22	0.01	0.018	0.23	0.02	....	5.92
Chrome	C2	0.76	0.42	0.02	0.015	0.28	0.03	1.00	....
Chrome	C3	0.47	0.27	0.02	0.02	0.22	0 03	2.77	....
Manganese	M4	0.40	0.80	0.03	0.03	0.49	0.06	....	....
Manganese	M5	0.50	1.20	0.02	0.03	0.59	0.08	....	....
Manganese	MS	0.65	1.25	0.01	0.02	1.20	0.02	....	....
Chrome-nickel	CN1	0.11	0.40	0.01	0.02	0.16	0.02	0.67	3.21
Chrome-nickel	CN2	0.24	0.20	0.015	0 013	0.23	0.02	1.93	4.50
Chrome-nickel	CN3	0.35	0.54	0.01	0.02	0.21	0.03	1.60	3.00

Table 2.—Specific Gravity, carbon steels, annealed and quenched

Mark	Annealed	Quenched	Decrease
K 2	7.863	7.848	−0.015
K 3	7.854	7.807	−0.047
K 4	7.857	7.780	−0.077
K 5	7.847	7.760	−0.087

Table 4.—Result's with water and oil

Mark	Water	Oil	Difference
K 2	7.857	7.856	−0.001
K 3	7.802	7.809	+0.007
K 4	7.768	7.823	+0.064
K 5	7.762	7.814	+0.052
B	7.766	7.776	+0.010

Table 3.—Results from quenching carbon steels from different temperatures

Quenching Temperature, Deg. C.	K 2	K 3	K 4	K 5
1200	7.854	7.804	7.774	7.752
1175	7.857	7.806	7.772	7.752
1135	7.854	7.796	7.765	7.751
1105	7.855	7.798	7.769	7.759
1070	7.857	7.795	7.768	7.754
1045	7.856	7.802	7.767	7.759
1005	7.861	7.801	7.772	7.771
965	7.858	7.802	7.763	7.761
930	7.853	7.795	7.762	7.761
900	7.858	7.803	7.769	7.777
860	7.854	7.802	7.770	7.806
820	7.851	7.804	7.779	7.810
790	7.855	7.848	7.836	7.830
765	7.855	7.844	7.839	7.834
Annealed	7.863	7.854	7.857	7.847

steels with higher carbon it is less. This is particularly the case with steel B, where quenching in oil gives almost the same increase as quenching in water.

Tests were then made consisting of repeated quenching and annealing between quenchings. The results are as given in Table 5.

By annealing after quenching the original volume is not again obtained, and with each repeated quenching and annealing the difference in the two states is smaller, from which it appears probable that effort is being made to reach a fixed value. The tests could only be carried on to a limited extent owing to the formation of hardening cracks.

The next step was the investigation of the influence of tempering on the hardened steels, and as a preliminary pure copper and pure iron were examined. Pure copper showed that its density was little changed by thermal treatment, the specific gravity in the quenched and annealed conditions showing little difference. The contraction that reaches a maximum at about 185 deg. on tempering is striking, and is shown in Fig. 3. So far as is known, no changes of structure are brought about in pure copper by quenching, so the assumption is that this contraction is due to the release of stresses from quenching. A similar result was obtained with chemically pure electrolytic iron that was melted and forged before the test. The results are given in Table 6 and shown in Fig. 4.

From further tests it was then determined that the speed of cooling after tempering has no influence on the final volume. The results of the influence of tempering on the quenched carbon steels are given in Table 7 and Figs. 5 to 9, the quenching temperatures being 990 deg. C. for K2, 950 deg. for K3,

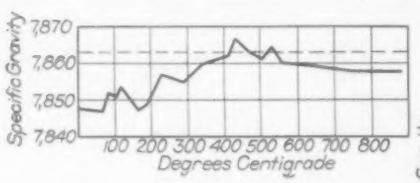
Table 8.—Results on special steels, annealed and quenched

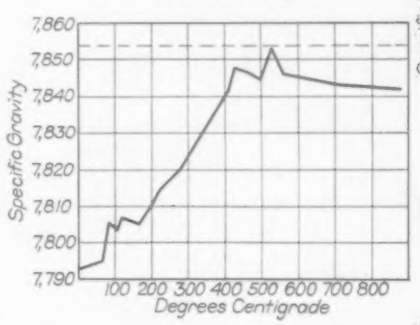
Test	Annealed at 900 Deg.	Quenched 960 Deg. in Water		Quenched 860 Deg. in Water		Quenched 86[illegible] Deg. in Oil	
		Sp. Gr.	Diff.	Sp. Gr.	Diff.	Sp. Gr.	Diff.
N8	7.865	7.862	−0.003	7.866	+0.001	7.860	−0.005
N9	7.852	7.830	−0.022	7.829	−0.023	7.836	−0.016
NO	7.868	7.841	−0.027	7.845	−0.023	.....	.....
C2	7.838	.....	.....	7.780	−0.058	7.783	−0.055
C3	7.831	7.792	−0.039	7.802	−0.029	7.804	−0.027
M4	7.835	.....	.....	7.803	−0.032	7.812	−0.023
M5	7.822	.....	.....	7.774	−0.048	7.781	−0.041
M8	7.794	.....	.....	7.746	−0.048	7.751	−0.043
CN1	7.879	.....	.....	7.869	−0.010	7.873	−0.006
CN2	7.881	.....	.....	7.854	−0.027	7.856	−0.025
CN3	7.869	.....	.....	7.833	−0.036	7.839	−0.030

900 deg. for K4, 1000 deg. for K5 and 900 deg. for M. A great number of tests had to be thrown out due to hardening cracks, the strongest inclination to which was shown by K4.

The following conclusions may be drawn from the results:

The volume of the quenched steels decreases with tempering, and this decrease is greater the higher the carbon contents (corresponding to the increase in volume with quenching).





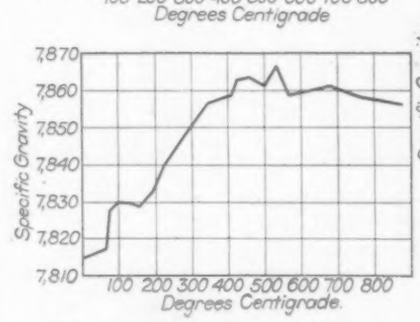
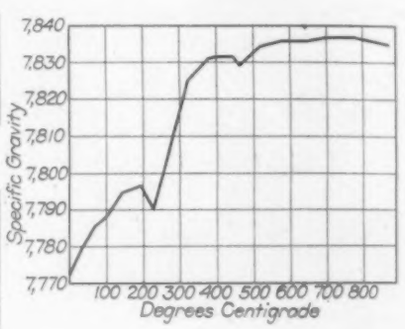


Fig. 5—Results on Tempering K2
Fig. 6—Results on Tempering K3
Fig. 7—Results on Tempering M



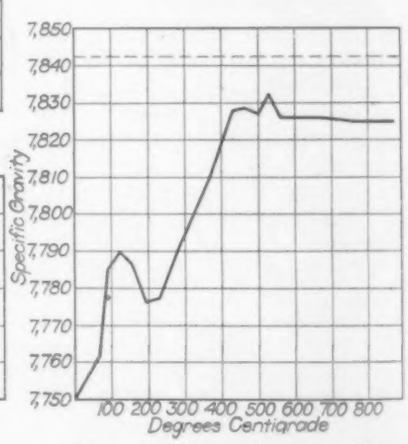


Fig. 8—Results on Tempering K4
Fig. 9—Results on Tempering K5

The decrease in volume shows irregularities as follows:

A. From 0 to about 150 deg., decrease in volume.
B. From 150 to about 200 deg., increase in volume.
C. From about 200 to 430 deg., decrease in volume.
D. Above 430 deg. (apart from a slight jog in the curve), a small increase in almost all cases.

These irregularities are more pronounced the higher

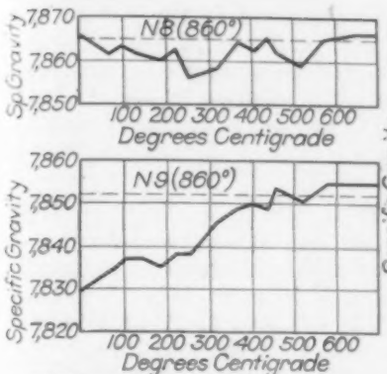
Table 5.—Results of repeated quenching and annealing

Treatment	K 2	Dif.	K 3	Dif.	K 4	Dif.	K 5	Dif.	M	Dif.
Annealed.	7.863	.....	7.854	.....	7.857	.....	7.847	.....	.....	.....
Quenched 950....	7.848	−0.015	7.793	−0.061	7.780	−0.077	7.750	−0.097	7.815	.....
Annealed 900....	7.858	+0.010	7.842	+0.049	7.842	+0.062	7.825	+0.075	7.857	+0.042
Quenched 1000...	7.850	−0.008	7.791	−0.051	*	.....	7.755	−0.070	7.819	−0.038
Annealed 1000...	7.855	+0.005	7.838	+0.047	.....	.....	7.795	+0.040	7.855	+0.036
Quenched 1000...	7.852	−0.003	*	.....	.....	.....	*	.....	*	.....

*Cracks.

Table 6.—Results with pure electrolytic iron

Reheated at deg.	Quenched from 850° C.	Quenched from 1150° C.	Reheated at deg.	Quenched from 850° C.	Quenched from 1150° C.
...	7.884	7.889	375	7.884	7.882
100	7.881	7.886	400	7.883	.....
150	7.890	7.905	450	.....	7.881
200	7.870	7.880	475	7.884	.....
250	7.871	7.884	500	7.888	7.886
300	7.878	7.878	600	7.890	.....
325	7.883	.....	.....	.....	.....
360	.....	7.883	Untreated	7.886	



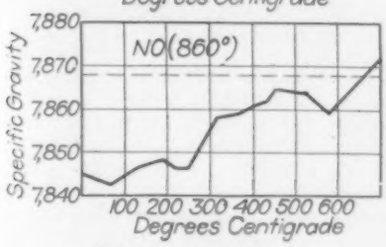
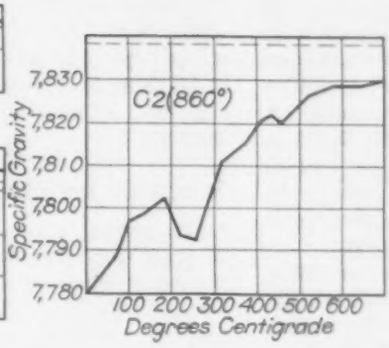


Fig. 10—Steel No. 8
Fig. 11—Steel No. 9
Fig. 12—Steel NO



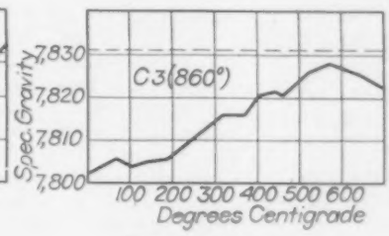


Fig. 13—Steel C2
Fig. 14—Steel C3

the carbon in the steel, but can be seen with all the steels.

A tempered steel reaches its greatest density at about 430 deg., but, as mentioned before, the density of the original annealed steel is not again obtained.

Quenching and tempering tests were then made on the special steels, and in Table 8 are given the results on annealed steels and after quenching under different conditions.

When quenched from 960 deg. in water several of the steels always gave hardening cracks, so that the specific gravity could not be determined. It is especially noticeable that the results from quenching in water and oil do not show great differences. The nickel and chrome steels show a smaller increase in volume with quenching than plain steels of the same carbon. This is also true of the manganese steels, although not to so great an extent, while the chrome-nickel steels show a proportionally great change of volume. Although these results do not apply to all the special steels, yet it is certain that through suitable special additions (from the above the best through nickel) the change in volume from quenching can be greatly reduced.

Table 7.—Results with tempered carbon steels

Tempered at deg.	K 2 (1)	K 2 (2)	K 3	M	K 4 (1)	K 4 (2)	K 5 (1)	K 5 (2)
Quenched	7.848	7.848	7.793	7.815	7.770	7.772	7.750	7.751
70	7.846	7.847	7.795	7.818	7.785	7.786	7.762	7.762
90	7.852	7.852	7.805	7.828	.....	.....	7.785	7.786
105	7.850	7.851	7.804	7.830	7.787	7.789	7.787	7.788
120	7.852	7.854	7.807	7.830	.....	.....	7.790	7.790
142	.....	.....	.....	.....	7.792	7.795	.....	.....
166	7.846	7.847	7.805	7.829	.....	.....	7.786	7.787
190	7.849	7.849	7.808	7.832	7.799	7.797	7.766	7.775
225	7.857	7.857	7.815	7.840	7.791	7.790	7.767	7.767
255	.....	.....	.....	.....	7.801	7.799	.....	.....
290	7.852	7.855	7.822	7.849	.....	.....	7.792	7.794
320	.....	.....	.....	.....	7.823	7.826	.....	.....
345	7.857	7.860	.....	7.857	.....	.....	7.806	7.810
375	.....	.....	.....	.....	7.830	7.831	.....	.....
410	7.861	7.862	7.842	7.859	7.831	7.832	7.823	7.823
430	7.868	7.867	7.848	7.863	.....	.....	7.828	7.829
440	.....	.....	.....	.....	7.831	7.832	.....	.....
460	7.867	7.864	7.847	7.864	7.828	7.829	7.829	7.830
500	7.865	7.861	7.845	7.861	.....	.....	7.827	7.827
520	.....	.....	.....	.....	7.838	7.835	.....	.....
530	7.873	7.865	7.853	7.867	.....	.....	7.833	7.833
560	7.865	7.860	7.846	7.859	.....	.....	7.826	7.827
580	.....	.....	.....	.....	7.836	7.836	.....	.....
645	.....	.....	.....	.....	7.838	7.836	.....	.....
675	7.863	7.859	7.844	7.861	.....	.....	7.826	7.826
700	.....	.....	.....	.....	7.838	7.837	.....	.....
750	7.862	7.858	7.843	7.859	.....	.....	7.825	7.824
780	.....	.....	.....	.....	7.837	7.837	.....	.....
880	7.858	7.858	7.842	7.857	7.835	7.835	7.825	7.825

The results obtained on tempering the quenched special steels are given in Table 9, and some of them are shown in Figs. 10 to 14.

The curves show considerable difference to the plain carbon steels; in particular the irregularity noticed between 150 and 200 deg. is either very weak or not noticeable in the nickel and chrome steels. Also no maximum value is seen at about 430 deg., and the nickel and chrome steels show a smaller total change of volume than the plain steels. The following conclusions are of practical importance:

1. The change in volume brought about by quenching steel is only small if the quenching temperature is within a limit close to the critical temperature. Very great changes in volume are brought about if this limit is even slightly exceeded.

2. Oil hardening gives smaller changes in volume than water hardening, but the difference is not very great.

3. Special additions, particularly nickel, bring about a decrease in the change of volume.

4. The greatest tendency to hardening cracks is shown by eutectoid steel, even greater than with steels of higher carbon that show greater change in volume.

Experiments were then carried out on the quenching of larger pieces, the first being bars 5 mm. thick which would be completely changed to martensite. The steels varied in carbon percentage, being 0.20, 0.50, 0.85 and 1.15 per cent. Pieces about 50 and 100 mm. long were quenched in oil and water and carefully measured. In no case was any contraction found. Also the increase in length grows with increasing carbon. The change in length is less when quenched in oil than in water, this being particularly noticeable with steels of about 0.45 per cent. carbon.

Fig. 15

Fig. 15—Change in Shape of Small Cylinders on Quenching. Fig. 16—Change in Shape of Tall Cylinders

Fig. 16

The change in length with the same material is almost exactly proportional to the length of the bars. These results agree very well with those previously obtained, but show that when the change to martensite is complete, whatever the carbon of the steel, there is no contraction. As these tests showed that the carbon had only a quantitative effect the

Table 9.—Results on tempering quenched special steels

Test	N 8	N 8	N 9	N 9	N O	N O	C 2	C 3	C 3
Tempered at Deg.	960	880	Qu 960	ENCHI 860	NG TE 960	MPERA 860	TURE 860	960	860
Quenched	7.802	7.866	7.831	7.829	7.841	7.845	7.780	7.792	7.802
72	7.864	7.861	7.835	7.834	7.844	7.843	7.789	7.797	7.806
105	7.864	7.863	7.824	7.837	7.845	7.845	7.797	7.795	7.804
142	7.864	7.861	7.838	7.837	7.845	7.847	7.799	7.797	7.805
190	7.862	7.860	7.839	7.835	7.845	7.848	7.802	7.801	7.806
225	7.864	7.862	7.837	7.838	7.848	7.846	7.791	7.802	7.809
255	7.860	7.856	7.849	7.838	7.845	7.846	7.792	7.804	7.811
320	7.860	7.858	7.848	7.845	7.858	7.858	7.811	7.806	7.816
375	7.862	7.864	7.850	7.849	7.860	7.859	7.815	7.810	7.816
410	7.866	7.863	7.851	7.850	7.859	7.861	7.820	7.815	7.821
440	7.867	7.865	7.852	7.849	7.862	7.862	7.823	7.816	7.822
460	7.864	7.862	7.853	7.854	7.864	7.865	7.820	7.814	7.819
520	7.863	7.859	7.851	7.851	7.863	7.864	7.826	7.819	7.826
580	7.866	7.865	7.855	7.855	7.860	7.859	7.829	7.822	7.828
645	7.865	7.866	7.854	7.855	7.862	7.866	7.829	7.822	7.826
700	7.865	7.866	7.856	7.855	7.867	7.871	7.830	7.821	7.823

further work was done on one steel only, steel B with 1.10 per cent. carbon. Small cylinders were prepared 50, 40, 30, 20 and 10 mm. diameter, and varying hights from 5 to 100 mm. These were carefully increased before and after treatment, which consisted of quenching in water from 900 deg. C. Those with a diameter of 10 mm., as well as those up to 10 mm. high, which were completely changed into martensite, gave the same results as the pieces 5 mm. thick, showing no peculiarity. The others may be separated into two classes according as to whether the diameter is greater than the hight or less, the first being called plates and the second cylinders. Those in which the dimensions are equal form an intermediate class. In general the plates show expansion in every direction, but by no means uniform, being shown diagrammatically in Fig. 15. With the cylinders there is contraction in the hight, and the diameter is changed as shown in Fig. 16, altogether different from the short pieces. The detailed results are given in the original treatise.

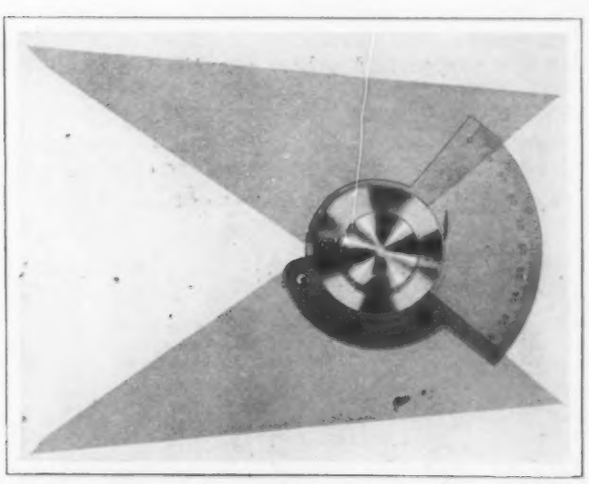
The remainder of the paper deals with the theory for these changes of dimensions. The main reasons are given as the changes from pearlite to martensite, sorbite, troostite, etc.; but it is also thought that the induced stresses play a very important part.

G. B. W.

A Combination Drafting Instrument

As a substitute for drafting machines and triangles and protractors, the 3-in-1 Company, Hartford, Conn., has developed a combination drafting instrument. As the name indicates, three instruments are combined in one. Among the uses to which it can be put are dividing circles, drawing oblique parallels and lines at right angles to oblique lines, in transferring angles and laying off given angles on each side of a line without changing the setting.

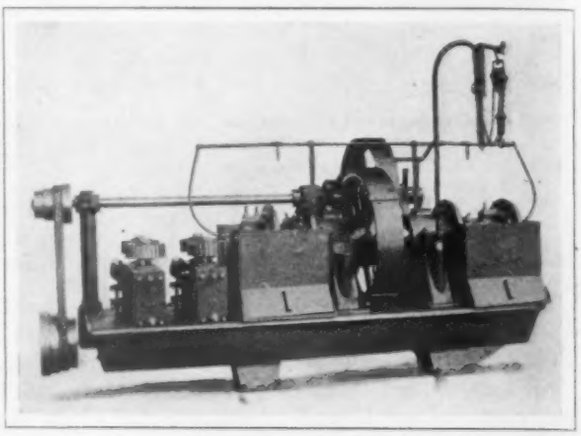
The instrument consists of a 90-deg. protractor and two adjustable transparent blades. The former is an arc having a diameter of 4 in. and graduated in degrees. Either blade can be used against a T-square or straight edge, thus giving any desired angle and its complement from 0 to 90 deg. The clamping screw is relied upon to hold the blades at any desired angle and also serves as a thumb-knob, thus making the instrument easy to handle. It will be noticed from the accompanying illustration that the longer of the two edges opposite the bases of both adjustable triangular blades is cut at slightly different angles. The main portion of this edge would if produced make an angle of 30 deg. with the prolongation of the adjacent edge of the blade while the short portion of the edge at the end of the blade is cut to form an angle of 45 deg. with the other edge. In this way by setting the protractor at 90 deg., it is possible to secure a 90-deg., two 45-deg., two 30-deg. and two 60-deg. angles simultaneously.



A Drafting Instrument with Transparent Blades That Gives an Adjustable Triangle Combined with a Protractor

Machine for Rough Turning Shell Blanks

A special machine for turning vanadium and other alloy steels for shell and shrapnel work has been developed by the Brightman Mfg. Company, Columbus, Ohio. It is intended to be used in the preparation of the blanks from the round rough bar before they go to the automatic machines that convert them into shell or shrapnel cases. The capacity of the machine is from 1000 to 1500 ft. of 2-in. round stock in 10 hr., the output for other sizes within its range, 1 to 6 in. inclusive, being in the same proportion.



A Special Machine That Has Been Developed for Preparing Shell and Shrapnel Blanks from Rough Bars Prior to Employing the Automatic Screw Machine

A set of feed rolls driven by worms and worm wheels feed the rough bar or rod in at one end of the machine. The worm gearing is attached to vertical and horizontal shafts and the rate of feed is regulated by a four-step cone pulley. After the material leaves the feed rolls it enters the roughing head, where it is brought down to almost the finished size. From the roughing head the material passes through a cylinder having hollow bearings to the finishing head, where it is turned to the correct diameter. Both of the heads are composed of a steel cutter and guides set in segmental slots with a screw adjustment and are bolted to the cylinder through which the work passes. This cylinder is driven by a gear and pinion, the latter attached to a horizontal shaft with different sizes of pulleys to give various rates of speeds. If desired, motor drive can be substituted for this shaft. Tracks with a gripping device which keeps the material from revolving with the machine are located at each end. After the material leaves the finishing head it is ready for the automatic machines to complete the work.

The bed of the machine is a receptacle for the soap solution which is continually discharged over the cutters by a small pump at the rear and drains back into the bed for use over and over again. The cutter heads are surrounded by boxes that are used for chips and turnings. The sides are arranged so as to open and enable the boxes to be cleaned readily while the machine is in operation.

The Mesta Machine Company Pittsburgh, recently furnished two large blowing engines for the blast furnaces of the Pennsylvania Steel Company, Steelton, Pa., These engines were successfully started last week.

FUSIBLE PLUGS FOR BOILERS

Bureau of Standards Finds Failures Due to Impurities in Tin

WASHINGTON, D. C., June 22, 1915.—An investigation of fusible tin boiler plugs, just completed for the Bureau of Standards by Dr. G. K. Burgess and P. D. Merica, will probably result in the substitution of a new series of specifications for those heretofore employed by the Steamboat Inspection Service, the American Society of Mechanical Engineers and the Interstate Commerce Commission. The results of the investigation indicate that through the lack of technical knowledge on the part of manufacturers and users of the behavior of tin plugs containing relatively small percentages of impurities this safety device has been rendered practically valueless in the average boiler. By the use of simple precautions suggested by the Bureau's experts, it will be entirely practicable to produce plugs that may be relied upon to fulfill their functions under all conditions.

The fusible boiler plug in its usual form consists of a brass or bronze casing with external pipe thread, filled from end to end with a fusible metal or metal composition which has a melting point around 480 deg. F. These plugs are fitted at various places into the boiler, in the flues, tubes or combustion chamber, in such a position that they are about 1 in. or more above the dangerous low water level, with one end on the fire and one end on the water side. As long as the water level in the boiler is above these plugs, the temperature of the latter remains below the melting point of the filling, but if the water falls much below the level of the plug, opportunity is given for local overheating and the filling of the plug then melts and is blown out. Fusible plugs are widely used not only throughout the American merchant marine, but also in factory and locomotive boilers. They are not used in the United States naval service, the practice there not favoring the installation of safety devices of any sort, fusible plugs or otherwise, as it is considered that their presence fosters negligence.

TIN OF PLUG CHANGED TO TIN OXIDE

Tin seems to be the metal used at present almost exclusively as the fusible constituent of such plugs and is required by all standard specifications. It would seem to be in this respect a desirable metal, having a low melting point, being only slightly corrodible and easily obtained pure. Its desirability in this respect is nevertheless to some extent called in question by the results of the investigation which has just been completed by the Bureau of Standards. This inquiry was undertaken to determine why certain plugs have been found intact in boilers which have exploded as the result of low water and consequent overheating of the boiler plates. Heavy loss of life occurred as a result of one of these explosions. The plug in this case was sawed open longitudinally and was found to contain traces only of the original tin, imbedded in a dirty, greenish matrix, which was ascertained to be largely tin oxide, and which upon test showed a melting point about 2900 deg. F. This oxide was distributed in such a form and quantity that it held the pressure of the boiler and would not have melted until the bronze of the casing and even the steel of the boiler had melted. It is obvious from this examination that when reliance is placed upon such a plug to give warning of dangerous boiler conditions, it is to be looked upon as an actual source of danger instead of safety.

PLUGS OF FAULTY MANUFACTURE

The question thereupon arose as to the source of the tin oxide, as to whether it was there originally, or had been formed by corrosion, and if so, is the cause for its comparatively rare occurrence in such plugs to be sought wholly in the different operating conditions of the boilers, or is it a fault in the method of manufacture? A request was made of the Steamboat Inspection Service that more plugs be sent in to the Bureau for test, including both new plugs and those which had been removed by inspectors. About 1050 plugs were subsequently received, of which about a hundred had been in service varying from 4 to 12 months. The entire collection represented the products of 105 firms of manufacturers. After these plugs were tested for dimensions, they were sawed open axially through the center, and the form and condition of filling observed. Particular attention was paid to the presence of oxide, scoriae, blow holes and other faults originating either in the manufacture of the plugs or during their service.

The specifications at the time these plugs were manufactured called for a bore "tapering evenly from end to end of filling." Nearly 10 per cent. of the 1050 plugs, manufactured by 30 firms, failed to correspond to this specification. Some contained fillings having ribs projecting into the casing, others had threaded fillings, while still others contained fillings which were not tapered along their entire length. In a few cases the bore of the casing had not been machined after casting and the filling could be easily dislodged from the casing.

SMOOTH BORE PLUG NOT RECOMMENDED

The Bureau's investigation demonstrated that the correct design of a fusible plug is of more importance than might be supposed. Owing to the difference in the coefficients of expansion of the casing and of the filling of such a plug and to the existence of an allotropic change in tin at 320 deg. F., there will be interplay between casing and filling unless the design is such as to support the filling rigidly in the casing and the adhesion between the two is excellent. A smooth bore "tapering evenly from end to end" is, therefore, not to be recommended, and it is noted that the Steamboat Inspection Service has recently allowed a fine inside thread. In the opinion of the Bureau's experts, however, there is no reason why a thread should be allowed and not other types of recess or projecting shoulder to keep the tin filling rigidly in place.

As the result of the examination of the sample plugs and an investigation of the reported failures and of certain tests made at the Bureau, it appears that the failures of tin plugs are of two types; first, those in which the oxide forms as an interlocking "network" throughout the tin of the filling and, second, those in which the oxide forms as a solid, hard mass at the fire end of the plug. An explanation of the formation of the network was found in the presence of zinc in amounts varying from 0.3 to 4.0 per cent. The experts also reached the conclusion that plugs containing zinc in quantities mentioned were apparently in good condition when inserted, but subsequently underwent a progressive change, becoming no longer fusible in the sense that they would melt below a temperature sufficient to fuse the steel plates of the boiler.

ZINC SHOULD NOT BE USED WITH THE TIN

"The fact that stands out most strongly throughout this investigation," says the report in conclusion, "is that zinc should not be present in the tin fillings of fusible plugs. The lowest zinc content actually found in any of the plugs analyzed, which displayed the network type of oxidation, was 0.3 per cent., but this cannot be accepted as the actual lowest value of the tin content at which oxidation can take place. Furthermore, although zinc is, because of its greater corrodibility, most dangerous when coalesced into a network of structure such as is developed upon heating to about 180 deg. C., other metals which do not form solid solution with tin may also cause the formation of this structure, as, for instance, lead. It seems then that in such plugs tin must be used which is as free as possible from zinc and lead. This statement is made notwithstanding the apparent fact that if zinc is present a small content of lead is actually beneficial; it is better to prevent this oxidation by using pure tin than by using lead with tin containing zinc." The inference from the investigation, therefore, is that the oxidation of the tin in service would cease with the introduction of the use of a tin of purity equal to that of Banca, probably also of tin of purity equal to that of Straits, or Pyrmont.

"Considering now the three sets of specifications, it is seen that any set of specifications such as those of the Interstate Commerce Commission which totally ignore the question of the purity of the tin are entirely insufficient. The specifications of the American Society of Mechanical Engineers seem to limit the quality of the tin in calling for tin of a melting point between 400 deg. and 500 deg. F., but in reality this specification has no significance from the standpoint of the purity of the tin, since it would admit tin containing as much as 65 per cent. of lead or 15 per cent. of zinc. Manifestly such a specification is worthless. The Steamboat Inspection Service requires at present Banca tin but proposes to amend this paragraph to call for 'tin 99.7 per cent. pure, containing not more than 0.1 per cent. lead and not more than 0.1 per cent. zinc.' The latter is doubtless a more practical specification than the former, but there is no doubt that better tin than this can and should be obtained for such plugs."

W. L. C.

APRIL FOREIGN IRON TRADE

Tonnage Exports Largest Since July, 1913—Tonnage Imports Increase but Are Less than 1914

The report of the Bureau of Foreign and Domestic Commerce for the month of April, 1915, shows that the value of the exports of iron and steel was $25,302,649, as compared with $20,639,569 in April, 1914. The imports of these commodities were valued at $1,410,679 in April, 1915, while the value for the same month of 1914 was $2,893,280. The value of these exports for the ten months ended with April was $167,594,643, as compared with $212,818,674 for the corresponding period of 1914. The import figures were $18,611,281 and $26,119,571 respectively.

Imports for which quantities are given amounted to 16,569 gross tons in April, as compared with 8054 tons in March, 7505 tons in February, 10,569 tons in January and 30,584 tons in April, 1914. The only exceptions to the general falling off were ferrosilicon, scrap and steel rails, the last increasing from 2098 tons in 1914 to 8921 tons this year. The decline in structural iron and steel from 2174 tons in 1914 to 148 tons in 1915 was the greatest falling off.

Details of the imports of tonnage commodities in April and the ten months ended with April, as compared with the corresponding periods of the previous fiscal year, are as follows:

Imports of Iron and Steel

	April		Ten months	
	1915. Gross tons	1914. Gross tons	1915. Gross tons	1914. Gross tons
Pig iron (including ferrosilicon)	.....	.....	.....	*38,892
Ferrosilicon	707	599	5,629	†2,648
All other pig iron	2,373	15,085	83,044	†68,082
Scrap	2,310	1,908	27,613	28,659
Bar iron	270	1,147	9,387	19,349
Structural iron and steel	148	2,174	5,507	9,352
Hoop or band iron	.....	.....	648	.....
Ingots, blooms and steel billets	.....	.....	.....	*6,317
Steel billets without alloys	617	1,031	1,572	†3,291
All other steel billets	738	5,102	21,247	†21,852
Steel rails	8,921	2,098	24,612	12,520
Sheets and plates	59	548	2,376	2,391
Tin and terne plates	44	161	4,652	18,973
Wire rods	382	731	3,853	10,202
Totals	16,569	30,584	190,140	242,528

*Figures cover period July 1, 1913, to Oct. 3, 1913, inclusive.

†Figures cover period beginning Oct. 4, 1913.

The tonnage of exports for which quantities are given was the highest since July, 1913, when this country sent 237,157 gross tons of iron and steel and manufactures thereof abroad. The total for April, 223,242 tons, is about 28 per cent. more than the figure for March, which was 174,269 tons. As compared with February, which showed an increase of approximately 3½ per cent. over January, March made a gain of about 20.4 per cent. The increase in the exports in April, 1915, as compared with April, 1914, was slightly less than 38 per cent. The totals are: April, 1914, 161,952 gross tons; January, 1915, 139,789 tons; February, 144,553 tons; March, 174,269 tons, and April, 223,242 tons. Practically all the commodities show increases, billets and barb wire being the most noticeable. In March the exports of billets were 26,410 tons, an increase over 1914 of approximately 525 per cent., and in April they were 41,321 tons, an increase of nearly 56 per cent. over March and almost 730 per cent. over April, 1914. The exports of barb wire do not show such a marked increase, being only 142 per cent. more in April of this year than in 1914 and but little more than 10 per cent. larger than in March, 1915. Steel sheets and structural iron and steel fell off most of all the exports. The total value of the iron and steel exports for which tonnages are given was $8,966,489 in April, 1915, as compared with $6,500,769 in April, 1914, the average value per ton for the two months being $40.16 and $40.14 respectively.

Details of the exports of these tonnage commodities in April and the ten months ended with April, compared with the corresponding periods of the previous fiscal year, are as follows:

Exports of Iron and Steel

	April		Ten months	
	1915. Gross tons	1914. Gross tons	1915. Gross tons	1914. Gross tons
Pig iron	16,182	13,039	89,902	177,375
Scrap	6,805	3,883	21,500	63,273
Bar iron	3,054	324	7,678	9,607
Wire rods	14,968	7,001	69,067	37,350
Steel bars	20,229	9,672	139,110	127,829
Billets, ingots and blooms, n.e.s.	41,321	4,997	123,026	34,928
Bolts and nuts	1,322	1,616	10,747	17,090
Hoops and bands	1,826	1,172	11,501	9,795
Horseshoes	1,781	110	9,196	1,055
Cut nails	421	326	1,852	3,513
Railroad spikes	250	725	4,618	6,797
Wire nails	5,044	3,040	38,832	31,190
All other nails, including tacks	487	257	3,463	2,647
Pipes and fittings	.....	18,163	.....	206,405
Cast pipes and fittings	4,815	.....	50,940	.....
Wrought pipes and fittings	11,440	.....	86,844	.....
Radiators and cast-iron house heating boilers	161	163	2,319	4,763
Steel rails	10,991	27,112	105,394	309,793
Galvanized-iron sheets and plates	7,844	5,208	37,551	47,314
All other iron sheets and plates	958	664	6,938	9,626
Steel plates	11,910	11,162	85,748	142,826
Steel sheets	6,083	14,389	77,222	117,902
Structural iron and steel	12,564	19,864	131,540	265,677
Tin and terne plates	9,084	5,345	65,210	35,398
Barb wire	16,721	6,911	105,283	67,714
All other wire	16,981	6,809	99,881	70,357
Totals	223,242	161,952	1,385,362	1,800,224

Imports of iron ore in April amounted to 91,561 tons, against 88,402 tons in March, 78,773 tons in February, 75,286 tons in January, and 111,812 tons in April, 1914. For the ten months ended with April, 975,565 tons was imported, as compared with 1,853,356 tons in the same part of the last fiscal year.

M. A. Hanna & Co. Changes

Under date of June 19, M. A. Hanna & Co., Cleveland, so long a prominent factor in iron ore, pig iron, coal and coke, announce that D. R. Hanna has retired from membership in the firm and that L. C. Hanna and H. M. Hanna, Sr., have associated themselves as firm members with the remaining partners, R. L. Ireland, M. Andrews and H. M. Hanna, Jr. D. R. Hanna is a son of the late Senator Hanna, who so long was the head of the firm. Senator Hanna's brother, L. C. Hanna, who was the active head in the years of the former's public life, withdrew from the organization soon after Senator Hanna's death and now returns. His brother, H. M. Hanna, Sr., was for many years at the head of the Globe Shipbuilding Company, one of the most important of the subsidiaries of the American Shipbuilding Company. D. R. Hanna retains his interest in the various companies for which M. A. Hanna & Co. are selling agents.

The Sterling Wheelbarrow Company, West Allis, Milwaukee, Wis., completed last fall a 7500-sq. ft. enlargement to its flask department and a second addition of the same size is now to be made at once. May, 1915, is the company's record month and represents only domestic business.

TESTING MATERIALS MEETING

First Day's Sessions of Annual Meeting at Atlantic City

The financial status of the American Society for Testing Materials was the uppermost topic for consideration at the first session of the eighteenth annual meeting which opened at Atlantic City, Monday morning, June 22, at the enlarged Hotel Traymore. The cost of operating the society for the last fiscal year amounted to $10.79 per member, 79 cents more than the amount of the annual dues. Various means of meeting the deficiency were advanced by the executive committee, including the institution of an initiation fee which is not now charged, or the increasing of dues of members $2.50 per annum and of juniors $1, or reducing the age limit when a junior becomes a member from 30 to 25 years—not to mention suggestions looking to retrenchment. The meeting voted agreement with the executive committee that nothing should be done which could be regarded as a backward step and that the subject should be the first order of business at the Wednesday evening session after the incoming and outgoing executive committees had a chance to study it on Wednesday afternoon. It should be explained that the increasing deficit in the treasury is chiefly attributable to the increasing volume of publications, the improved standards observed in connection with illustrated matter, and the cost of reprints. It is noteworthy that everything for presentation at all the sessions is in type and most of it distributed to the members considerably in advance.

NEW SPECIFICATIONS

Specification building goes on apace. Some of this is new with this society, such as several proposed tentative standards covering the problems of the automobile field. It is interesting that in view of the fact that the society could not give substantial support for the prosecution of work, the committee on corrosion of iron and steel raised a special fund of $2500. Among new specifications which are to be considered in the remaining sessions are the following:

Heat-treated high-carbon-steel splice bars.
Heat-treated carbon-steel track bolts.
Heat-treated alloy-steel track bolts.
Lap-welded and seamless boiler tubes for stationary service.
Welded steel and wrought-iron pipe.
Methods of chemical analysis for alloy steels.
Iron and steel chains.
Methods for the sampling and analysis of pig and cast iron (for export).
Cold-drawn steel: open-hearth automatic screw stock.
Carbon-steel bars for vehicle and automobile springs.
Silico-manganese-steel bars for automobile and railway springs.
Chrome-vanadium-steel bars for automobile and railway springs.
Helical and elliptical springs for railways.
Quenched-and-tempered alloy-steel axles, shafts and other forgings for locomotives and cars.

GROWTH OF INFLUENCE

The regular publications of the year totaled 1881 pages, exceeding in volume by 149 pages those of the preceding year. The membership at the last annual meeting was 1687 and now it is about 1865. Four new committees were created and now there are 39 technical committees. The executive committee put some emphasis on the increasing use of its specifications in Federal, State and municipal circles and mentioned that 27 of the specifications were now in use for purchases for the Panama Canal; that United States postal cars are purchased subject to its specifications; that nine of the specifications, with slight modifications in some cases, have been incorporated in the American Society of Mechanical Engineers' steam boiler code, and that seven are referred to in the current revision of the building code of New York City.

NEW OFFICERS

The new officers, whose election was announced at the close of the first session, are as follows:

President, Dr. Mansfield Merriman, consulting engineer, New York, who mentioned in acknowledging his election that 17 years ago he was chairman of the infant organization from which the society sprung.

Vice-president, Brig.-Gen. W. H. Bixby, U. S. A., retired, Washington, D. C.

Members of Executive Committee—James H. Gibboney, chief chemist Norfolk & Western Railway Company, Roanoke, Va.; Prof. William K. Hatt, Purdue University, Lafayette, Ind.; Dr. John A. Mathews, operating manager and general superintendent Halcomb Steel Company, Syracuse, N. Y., and Prof. Edward Orton, Jr., Ohio State University, Columbus, Ohio.

MALLEABLE IRON CASTINGS

Among the committee reports submitted Tuesday afternoon was a revision of the society's specifications for malleable iron castings. The report, submitted by Dr. Richard Moldenke, chairman of committee A-3, stated that "the feeling prevails that a change is bound to come sooner or later. This change will mean specific standard specifications for malleable castings intended for definite classes of work. Thus, it is well known that car castings of malleable iron must be soft enough to permit riveting, whereas conveyor chain links must be strong and inelastic." The idea is that ultimately one general specification will not serve the industry, but different ones will be needed for different classes of work.

A tentative specification for foundry coke was brought forward by committee D-6, Dr. J. A. Holmes, chairman, A. C. Fieldner, secretary. This stipulates that the volatile matter of the dry coke shall not exceed 2 per cent., that the fixed carbon shall not be under 86 per cent., that the ash shall not exceed 12 per cent. and that the sulphur shall not be over 1 per cent.

The evening session was given over to reports and papers on non-ferrous metals, but was opened, as has been the custom, with the presentation of the address of the president, A. W. Gibbs, who devoted himself to rail specifications.

Southern Pig-Iron Rate Case

WASHINGTON, D. C., June 22, 1915.—After a session lasting four days, three of which were given up to hearing testimony on the merits of the issues and one to arguments by counsel regarding the proper division of rates between Northern and Southern railroads, the Interstate Commerce Commission on June 21 adjourned the Sloss-Sheffield pig-iron rate case until October, when a date will be fixed for final argument. It is improbable that a decision in this case, which is a reopening of the original controversy, will be reached before December 1. The testimony at the recent hearing was chiefly that of railroad officials, designed to show that the commission, in reducing the rates on Southern pig iron to points in New England, was misinformed concerning the rail and water routes and, therefore, fell into fundamental errors which have worked a great injustice to the carriers. The hearing of evidence closed with the testimony of William J. Breen, on behalf of the Sloss-Sheffield Company, who presented a comparison of the rates on pig iron from Birmingham to tidewater for domestic use and for export shipment. Counsel for the Southern roads argued on the injustice of putting the 35-cent reduction all on those roads, Northern roads having refused to bear any of it. They asked that 20 cents be put upon the Northern roads. W. L. C.

War demand for antimony has increased the price of Chinese antimony ores from $170 to $700 per ton according to Huan-Hi Liang, a member of the Chinese Honorary Commission now in this country. Prior to the war the company of which he is president was smelting about 3000 tons of antimony per year, but decided expansion has recently taken place, a combination having been formed with the small producers of crude antimony. About 10,000 persons are now employed in the antimony industry in China.

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THE IRON AGE

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"Trusts" and High Steel Prices

It was not surprising that the attorneys for the Government in the suit against the Steel Corporation sought strenuously to make it appear that every advance in prices which came after the consolidation in 1901 or the lesser consolidations which preceded it was due to trust control. It was to be expected, however, that the judges who decided the case would go deeply enough into the facts to sift out causes from mere concomitants and to refuse to connect as cause and effect things which were not rightfully so related. But Judges Woolley and Hunt, who presented a separate but not dissenting opinion covering some of the questions at issue, plainly laid at the door of one consolidation price advances for which it had little or no responsibility, when they wrote:

> The net earnings of the National Tube Company for the first six months were $7,909,060, a rate of 19 per cent. per annum on the capitalization of $80,000,000; and the net earnings for the first fiscal year, after deducting expenses, depreciation and reserve, were $13,878,364.69, which is something over 17 per cent. on its total capitalization. Before the formation of the National Tube Company the price of tubes was $30 a ton. During 1899, the year of its formation, the price of tubes rose to $67 a ton, and in the early part of 1900 reached their maximum of $89 a ton.

No fact is better established concerning 1899 than that it was marked by the most violent rise in prices in iron trade history. And any who have made a study of its phenomena know that the suppression, in the depressed years 1893 to 1898, of new construction in iron and steel, and the using up of stocks in every line in those famine years, left the country bare of steel and with a capacity for production bound to prove inadequate when the dam holding back six years' accumulations of demand should finally break. Prices of products in which competition was freest made remarkable advances. From $9.25, Birmingham, in April, 1898, Southern No. 2 foundry iron went to $20.75 by the fall of 1899 and it stood at that figure at the beginning of 1900. Bessemer pig iron, which was $9.75 at Pittsburgh in early 1898, was $24.90 in November, 1899. Bessemer steel billets, which had sold at $14.50 at Pittsburgh in July, 1898, rose rapidly in 1899 until they reached $38.75, or more than $10 above the price of steel rails, about which so much has been said in denunciation of pool control.

The circuit court judges, whose opinion in so many particulars shows a thorough grasp of the intricacies of steel trade developments in the past 15 years, missed the outstanding fact of the trust-forming period—that the old law of action and reaction was at work, making the feast an inevitable sequel of the famine. It was rather a case of the high prices and profits of the fat years that followed the depression making possible the flotation of the consolidations than of the consolidations producing the high prices. Whatever the fruits of some consolidations have been, in respect to prices, the history of 1899 in the iron trade shows that the consolidations did not cause the phenomenal advances of that year. In the suit against the Steel Corporation its competitors testified that it generally held for higher prices than theirs in slack times and was apt to be under them when business was booming. Had the corporation existed in 1899 the probabilities are that it would have tried to hold values in bounds as it did in the lesser booms of 1902 and 1906.

Another Great Ford Project

Official confirmation of the report that the Ford Motor Company, Detroit, Mich., is contemplating the organization and construction of a plant for the manufacture of tractors, the undertaking to include a blast furnace operation, has in it the prospect of decidedly interesting developments. In all of the comment that the Ford policies and accomplishments have brought forth, the reservation has been prominent that here was a unique proposition, the conditions of which were unlike any other business, being susceptible of treatment quite impossible in ordinary and more competitive lines. It may even be contended that the immense wealth which has been accumulated by Mr. Ford places any other enterprise in which he may engage upon a pedestal above the exactions of competition. But when we consider the magnitude of the capital that has been available for the operation of existing blast furnaces and tractor works, their limitations both as to earnings and the basis for recompensing labor can hardly be traced to inadequate resources. If Henry Ford does build a blast furnace and a tractor works, it would appear as though he were entering upon one of our most competitive lines of manufacture—a field which represents as typically as any could an average operation from the standpoint of profits, wages, sales, competition and manufacturing problems. If he will be able to bring to this new enterprise, and he doubtless intends so to do, the same methods that have been successfully applied to the manufacture of the Ford car and accomplish like results, there will be

little room left for doubt regarding the possibility of a general application for much of the Ford programme now considered unique.

Encouragement for Manufacturers

For some time the deliverances of those occupying high official positions have been more agreeable to business interests. The disposition to say harsh things about business men has not only been softened but the tendency is toward building up hope for the future. This has been apparent for several months. All along the line, from direct representatives of the National Administration to those in charge of subordinate but important governmental activities, a disposition is shown to impart confidence to the interests upon which the material welfare of this country so directly depends. Of almost as great significance as anything of this character previously said is the address, on Sunday, June 20, at a pre-convention mass meeting of the Associated Advertising Clubs of the World, in Chicago, by Joseph E. Davies, chairman of the Federal Trade Commission. Mr. Davies paid a tribute to advertising and then spoke on the relation of business to government. After stating that the purpose of the Federal Trade Commission is not to harass but to help, he said:

> The recent cutting off of the European supply in certain lines, heretofore supplied from foreign markets, has demonstrated the necessity of the creation of independent, self-sustained, permanent industries indigenous to our conditions, for the production of such supplies. Such enterprise here is confronted with the possibility of unfair methods of competition being employed by foreign monopolies subsequent to the war. Tariffs have been found to be unsatisfactory to afford protection against such practices. "Dumping" by foreign monopolies into this country, either of their surplus products or of their competitive products, and the selling of such products at a cost in this country below the prevailing market cost in the country of their production, is vicious in practice and holds potentialities of great harm to American industry and to the American people. American enterprise and industry indigenous to our soil and native to our conditions are entitled to have such competition of foreign monopoly declared to be unfair and to have such practices prevented if sought to be employed.
>
> One of the most significant facts in the evolution of modern world industry has been the development of international cartels in Europe for the purpose, among others, of promoting foreign trade and of effecting economies in distribution in world competition. It has been urged that combinations of American manufacturers for the purpose of engaging in export trade be permitted for similar economies in export trade. Opportunity to participate in such economies might afford to the smaller manufacturer an opportunity to extend his market if participation in such an organization would be a matter of right rather than of largesse on the part of others in such organization. Competition in the foreign field is assured by reason of the international character of the market and the contest therefor by European manufacturers. Preservation of regulated competition at home is a matter of capacity for administration. These are matters connected with the Sherman law in connection with foreign trade to which the American people must address their attention.
>
> The admission of our incapacity to meet situations of this kind and still retain those principles fundamental to our form of government would constitute a confession that democracy must fail. If we cannot consciously shape our own evolution to the end that we may grow and prosper and still preserve equality of opportunity in industry, then we are unfit. Our whole history is a denial of such an attitude.

It is most gratifying indeed to observe that the head of this important commission is thoroughly awake to the peculiar conditions existing in European industries. Everybody in the steel trade has long been aware of the manner in which large combinations in Europe have stimulated the export trade of their members. The machinery adopted by these combinations and the efficiency with which it has been brought to bear in the building up of an export trade have been so frequently described by writers on business and economic subjects, and yet so little attention has apparently been paid to such matters by the makers of our laws, that it seemed as if all those having anything to do with our Government were definitely committed to completely ignoring them. It is, therefore, exceedingly refreshing to find that the chairman of the Federal Trade Commission, and undoubtedly he speaks for his associates also, is fully alive to the competition with American business interests in our own home market that is to be expected after the close of the European war. The manufacturers of the United States may well look forward with hope when representatives of the Government express themselves in this enlightened and refreshing fashion.

A Sheet Reform That Failed

A trifle over three years ago there was a movement in the steel sheet trade to correct an abuse of long standing but then rapidly growing, that of misrepresenting the gauge of corrugated sheets. It had been the trade custom to sell this product by area rather than weight, the unit being a square of 100 square feet, and it was easy for the unprincipled distributer to undersell a more honest competitor by quoting a lower price per square, but furnishing a lighter material.

The reform of the trade was undertaken by changing the basis and selling corrugated material by weight instead of by area. There was no possibility of the seller furnishing lighter material than ordered, as he would lose by so doing, while if he furnished heavier, the material would not cover the area computed and the buyer would readily discover the substitution. At the time of this movement the majority of the mills announced that they would in future sell by weight instead of area, and the leading interest, which was particularly anxious to adopt the reform, announced a schedule of extras per pound for forming either black or galvanized, and for painting the black.

Recent investigations show that however much progress the reform made at the start, the trade has since fallen largely into its old ways. The farther down the line the material passed, the more disposition there was to look upon it as so much area rather than so much weight. In the final analysis, of course, the steel is ordered to cover a definite area, and the buyer naturally desires to be assured that the material he orders will prove adequate when delivered.

As it has come to be well known that the change undertaken three years ago has not become universal, it is likely that there will be a more com-

plete return to the old style. In these circumstances it behooves the jobber, the retailer and the ultimate consumer to watch the weights carefully. The question is really one of quality. When one buys wall paper, for instance, he buys a definite area, but he first satisfies himself that the paper is sufficiently tough and heavy. In this case he has no standard. In the case of corrugated sheets the standards are well known and are printed everywhere, so that no buyer need be without information as to how much a square of one gauge or another should weigh.

Consumers of corrugated sheets are undergoing a forced education in the matter of weights at the present time, for since January the market price of galvanized sheets, flat or corrugated, has practically doubled, while the market price of flat black sheets or painted corrugated has not materially changed. Everywhere users of galvanized sheets are urged to substitute painted sheets, and this naturally leads to a comparison of gauges and weights. It is shown, for instance, that instead of using No. 28 gauge galvanized one can use a much heavier weight of painted steel and still save money. The situation causes dealers and consumers to study the weights, and it is but a step farther for the consumer, having learned what the weight of the gauge ordered should be, to put a square upon the scale and ascertain if he is receiving the last pound to which he is entitled.

Large New Spelter Plant for the Steel Corporation

The United States Steel Corporation, according to a statement of Chairman Gary given to the press in the past week, will build at Donora, Pa., adjoining the iron and steel plants of the American Steel & Wire Company, "a new plant for the manufacture of zinc and by-products, including sulphuric acid, at a cost of from $2,500,000 to $3,000,000." Consideration has been given for some years to the building of such a plant. Chairman Gary says:

> We have been buying of other manufacturers, but as there has been some difficulty or, at least, delay in supplying our necessities, we have reached the conclusion to proceed at this time.
>
> The market for the products of the plant is largely in the Pittsburgh district, and for this reason and the further reason that it is a good point for the assembly of raw materials, we have selected this location. We hope to be able to start operations on or before the first of next January.

Preliminary work has already been done in connection with the proposed plant and the construction will probably be carried on by the engineering staff of the American Steel & Wire Company. It is expected that the initial capacity of the new works will be 40,000 tons of spelter a year, which is about the amount by which the Steel Corporation's present production of spelter would fall short of meeting its requirements were the galvanizing operations of the American Steel & Wire Company, the American Sheet & Tin Plate Company and the National Tube Company carried on at full capacity.

The new Donora plant will mean a very considerably increased purchase of zinc ores by the Steel Corporation. The corporation is at present a producer of spelter through its subsidiary, the Edgar Zinc Company, which is tributary to the American Steel & Wire Company. At Cherryvale, Kansas, the zinc company has a plant consisting of 4800 retorts. A similar plant at Carondelet, Mo., has 2000 retorts. Production of spelter at these plants was 28,031 tons in 1914, 30,424 tons in 1913 and 31,318 tons in 1912.

A 12 months' supply of Australian zinc ores has been contracted for for the new Donora plant and transportation contracts closed. In addition to 40,000 tons of spelter there will be an annual output of 80,000 tons of sulphuric acid, which will be consumed in pickling and cleaning operations of Steel Corporation plants in the Pittsburgh district.

Gulf States Steel Company's Report

The Gulf States Steel Company, Birmingham, Ala., of which James Bowron is president, has issued its first annual report, bearing date January 1, 1915. It gives an interesting history of the vicissitudes through which the properties now owned by this company have passed. The business was established by the Alabama Steel & Wire Company in 1899, then merged into the Southern Steel Company, which became bankrupt in 1907, was reorganized as the Southern Iron & Steel Company in 1909, and then became bankrupt in 1912. After being handled by James Bowron as receiver the properties were sold January 31, 1913, to the nominees of a reorganization committee, transferred by them to a temporary holding company, the Standard Steel Company, and on December 1, 1913, all the assets and liabilities of that company were transferred to and assumed by the Gulf States Steel Company.

President Bowron describes the various steps taken since the last reorganization to put the several plants, ore mines, coal mines, etc., in condition to operate more efficiently. He enumerates the details of expenditure on these different accounts. After giving this information, he says it must not be inferred that the position of the business is satisfactory because these improvements have been made. It is not yet satisfactory to the operating management and can only be corrected by the expenditure of a considerable sum. He states that $200,000 will be required for the completion of the ore slope at Shannon, Ala., with equipment and houses, while $40,000 to $50,000 should be expended in improvements at the open-hearth steel plant. An outlay of $60,000 is urgently needed for the addition of automatic stokers to the rod-mill boilers. About $25,000 is needed to complete a 9-in. train of rolls for hoops, cotton ties, etc. Warehouses are needed for stocks of barb wire and fencing, costing $32,000. The bar mill requires some rearrangement and another heating furnace, costing about $35,000. The expenditure of $50,000 is recommended for sanitation and general welfare work. Modern by-product coke ovens are needed, on which the estimated outlay is $650,000. The construction of six additional machines for making field fence is suggested, to cost $30,000. In all, the expenditures recommended aggregate $1,218,000, on which the annual savings or increased profits are estimated at $341,500, without counting certain collateral advantages.

President Bowron says that since its formation this company has had to face disturbance of trade incidental to a changed fiscal system, based on low tariff duties, and most of its leading products coming in free to Gulf States seaports; the radical change in financial affairs and credits, due to the adoption of a new system in banking; and, worst of all, the unprecedented difficulty imposed upon its customers throughout the Gulf States by the rude disturbance to the movement and free marketing of cotton, due to the European war, which has crippled the purchasing ability of thousands of customers who might have bought its products. He says that it will justify confidence in the future of the company that it should, in the face of such difficulties, have been able to earn from February 1, 1913, to December 31, 1914, a period of 23 months, $279,005.53.

President Bowron suggests further that a Morgan combination billet and sheet bar mill be attached to the blooming mill at a cost of about $300,000, and that a sheet mill should be built at a cost of about $600,000.

A table added as an appendix to the report gives the estimated net earnings of the company in the current year as follows: January, $12,396.36; February, $29,924.03; March, $50,231.05; April, $59,317.77. The total for these four months was $151,869.21. The balance sheet shows profits from December 1, 1913, to December 31, 1914, of $111,186.06, which, added to the balance of $164,819.47 December 1, 1914, makes the surplus at the beginning of the present calendar year $276,005.53.

MANGANESE ORE STOCKS LOW

British Imports Greatly Lessened—Exports of Bars to France Large

Great Britain's iron and steel exports for May of this year and for the first five months to June 1 show a marked decrease in tonnage and in value. The total exports in May, excluding iron ore and scrap, were 263,225 gross tons against 426,357 tons for May, 1914, a decrease of 163,132 tons or about 38 per cent. The decrease for the first five months was from 2,018,126 tons to 1,179,630 tons, or 42 per cent. The falling off in values was £7,081,207 or from £21,425,716 to £14,344,-509. In pig iron the May movement was 15,233 tons compared with 82,170 tons in May, 1914. The exports of pig iron to June 1, 1915, were 99,505 tons, against 376,039 tons to June 1, 1914, a decrease of nearly 75 per cent.

The exports of steel bars increased in contrast with all other products. For May, 1915, they were 38,926 gross tons compared with 20,395 tons in May, 1914. France took 27,571 tons as compared with only 613 tons in May, 1914. To June 1, 1915, the total exports of steel bars were 185,575 tons compared with 93,475 tons to June 1, 1914, an increase of nearly 100 per cent. Of this large total France took 132,598 tons, against only 2075 tons to June 1, 1914.

The exports of galvanized sheets were 31,527 tons for May this year or 22,870 tons less than for May, 1914. The falling off for the first five months was 189,555 tons or nearly 60 per cent., the exports to June 1, 1915, being only 142,324 tons.

Exports of ferromanganese in May, 1915, were about 14,000 gross tons compared with about 12,750 tons in May, 1914, indicating in part the extent of the resumption of shipments to this country. Imports of manganese ore in May were only 5278 tons against 35,007 tons in May, 1914. Manganese ore imports fell from 205,217 tons up to June 1, 1914, to 107,297 tons up to June 1, 1915, or about half as much.

British imports of iron and steel apart from iron ore and scrap in May, 1915, were 117,377 gross tons against 184,092 tons in May, 1914. To June 1, 1915, the total imports were only 377,456 tons compared with 984,648 tons to June 1, 1914, a decrease of 607,192 tons or nearly 62 per cent. The values to June 1, 1915 and 1914, were £6,391,305 and £3,104,301 respectively.

Of iron ore the imports for May were 541,418 gross tons compared with 445,672 tons in May, 1914. To June 1, 1915, however, a decrease in iron ore imports is shown from 2,515,896 tons to 2,422,867 tons. Imports of crude zinc were 4591 gross tons for May, 1915, against 7783 tons for May, 1914.

India's Manganese Ore Exports Growing Less

Manganese ore exports from India in March, 1915, were 16,131 gross tons, of which 13,131 tons went to Great Britain and 3000 tons to France. In March, 1914, these exports were 61,917 tons. For the fiscal year ended with March, 1915, the total exports were 440,590 tons as compared with 718,049 tons for the corresponding period to March 31, 1914, a decrease of 277,459 tons or 38.5 per cent. Exports to the United States for the two periods were 73,503 tons and 106,327 tons respectively, a falling off of about 30 per cent.

The receivership of the Alton Steel Company, Alton, Ill., has been ended, the plant having been turned over to a syndicate headed by H. C. Fownes, Pittsburgh, Pa., which will finance its resumption of business. The company was placed in the hands of James Duncan as receiver July 8, 1914. About $60,000 will be expended improving the equipment.

The stockholders of the Rogers-Brown Iron Company, Buffalo, N. Y., voted June 21, to increase the company's capital stock from $6,000,000 to $7,000,000. The new issue will be 7 per cent. cumulative preferred, making $5,000,000 common and $2,000,000 preferred.

CONTENTS

Sheet and Tin-Plate Scales Settled

At the conference held at Atlantic City, N. J., last week between committees of the Amalgamated Association and of the sheet and tinplate mills in the Central West that sign the Amalgamated scale, an agreement was reached for the year commencing July 1. No important changes were made, but there were some slight readjustments. In the sheet-mill scale a slight reduction was made in wages of matchers and doublers, and this was given to the pair heaters and amounts to about 4 per cent. In the tin-mill scale the pair heaters, where they are required to double the sheets twice, or what is known as double doubles, the men were given an advance of about 6c. per ton on Nos. 26, 27 and 28 gauges. Where the black plates are doubled only once, the men do not get an advance. The mill signed the scale in conference, so that there will be no interruption whatever in operations of the union sheet and tin-plate mills this year.

A conference started in Atlantic City on Tuesday, June 22, on the bar-iron scale, and it is believed this will also be arranged before the meeting ends.

The new plant of the American Stamping & Enameling Company, Massillon, Ohio, is nearing completion. It is expected that the stamping department will be placed in operation within 30 days and the enameling department about two weeks later. The plant provides 250,000 sq. ft. of floor space.

The Iron and Metal Markets

BAR DEMAND VERY HEAVY

Tightness in Open-Hearth Steel Increases

European Inquiries for 200,000 Tons of Rails—Implement Bar Contracts Largely Closed

The drift of the steel situation is seen in the order given by the Carnegie Steel Company for starting up its North Sharon, Pa., plant consisting of six open-hearth furnaces and a blast furnace. The company is also considering putting its Bessemer steel works at Columbus, Ohio, in operation to supply steel to the sheet bar mill there. The Sharon and Columbus plants have been idle for more than two years.

The starting up of high-cost steel plants is significant. For some time it has been apparent that open-hearth steel output must increase if all the demand for open-hearth products is to be met. Bar exports have grown rapidly and since large discards from the ingot are called for by the specifications for large rounds for shells, the inroad on open-hearth capacity is greater than the tonnage indicates. At Pittsburgh and Youngstown the open-hearth steel situation has tightened. Demand for billets and sheet bars is active and prices have advanced to $21, Pittsburgh, for the former and $22 for the latter. Forging billets on contract have advanced to $27 and even higher has been paid.

The Steel Corporation's orders are now running about 10,000 tons a day more than its output and shipments are nearly 10,000 tons a day more than at this time last year.

Exports are growing fast and are now at the rate of 250,000 tons a month in products reported in tons. The Steel Corporation, having the great bulk of the commercial steel exports and much of those due to the war, is operating at 81 per cent, or higher than the average of its competitors. Some of the latter, especially where bars are a large factor, are operating well above 80 per cent of capacity.

Urgent inquiries have come from Europe for rails—200,000 tons in all, most of it for Russia. August delivery is wanted in part. The early placing of 150,000 tons in this country is expected. New rail business at home is limited to 5600 tons for the Southern, placed with the Pennsylvania Steel Company. The Lackawanna Steel Company will roll 6000 tons for the Cuba Railway.

In the Chicago district 20,000 tons of steel has been bought by one car builder, and for the Rock Island cars 25,000 to 30,000 tons is under inquiry. The Chicago & Northwestern is in the market for 1500 cars and the C. H. & D. for 2000.

Railroad inquiry for tie plates, spikes and bolts is larger and some makers have advanced spikes and bolts $1 a ton.

The bulk of the implement bar contracts is now on the books. The mills carried their point in limiting 1.15c. and 1.20c. sales to 1915 deliveries on the smaller contracts, but some large buyers covered for a full year's requirements from July 1. With but little exception, bars are now on a 1.25c. Pittsburgh basis, and with the large foreign business still coming up, the mills count on full operation for several months ahead.

The future of prices on plates and shapes is less clear than for bars. On plates 1.15c. and 1.20c., Pittsburgh, for third quarter have not disappeared, and the amount of new steel work in sight points to considerably less than full running of structural mills in the next three months.

A demand has developed for tin plate for shipment to France and Russia. On some of this business as high as $3.40 a box has been paid, against $3.10 and $3.15 in the home trade.

Wire mills are working on heavy foreign orders, but find the home trade featureless. Export houses are still asking bids on large lots of barb wire and wire rods.

The decline in spelter may ease the strain in galvanized products, but as the advance in galvanized sheets did not represent the top price for spelter, there have been as yet no reductions from the recent 5c. basis. Until the situation clears up little business in galvanized sheets is to be expected.

Pig iron, coke and scrap have been little affected by the activity in certain steel lines. At Pittsburgh a 10,000-ton purchase of basic iron is about closed; a steel company with its own blast furnaces is expected to be a buyer of basic, and a round lot has been bought by a New Jersey steel company. A Shenango Valley furnace has sold 6000 tons of Bessemer iron for shipment to Italy.

Foundry iron is inactive, but here and there, particularly in the East, the melt is showing some increase in machinery lines.

A Comparison of Prices

Advances Over the Previous Week in Heavy Type. Declines in Italics

At date, one week, one month and one year previous

	June 23, 1915.	June 16, 1915.	May 26, 1915.	June 24, 1914.
Pig Iron, Per Gross Ton:				
No. 2 X, Philadelphia....	$14.25	$14.25	$14.25	$14.75
No. 2, Valley furnace....	*12.50*	12.75	12.75	13.00
No. 2 Southern, Cin'ti....	**12.65**	12.40	12.40	13.50
No. 2, Birmingham, Ala..	**9.75**	9.50	9.50	10.25
No. 2, furnace, Chicago*.	13.00	13.00	13.00	13.75
Basic, del'd, eastern Pa..	**13.75**	13.50	13.25	14.00
Basic, Valley furnace...	12.65	12.65	12.50	13.00
Bessemer, Pittsburgh....	14.70	14.70	14.70	14.90
Malleable Bess., Ch'go*..	13.00	13.00	13.00	14.00
Gray forge, Pittsburgh..	13.35	13.35	13.45	13.65
L. S. charcoal, Chicago..	15.75	15.75	15.75	15.75
Billets, etc.				
Per Gross Ton:				
Bess. billets, Pittsburgh.	**21.00**	20.50	20.00	19.00
O.-h. billets, Pittsburgh..	**21.00**	20.50	20.00	19.00
O.-h. sheet bars, P'gh...	**22.00**	21.50	21.00	20.00
Forging billets, P'gh.....	**27.00**	26.00	26.00	25.00
O.-h. billets, Phila.....	22.02	22.02	22.02	22.40
Wire rods, Pittsburgh...	25.00	25.00	25.00	24.50
Finished Iron and Steel,				
Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Bess. rails, heavy, at mill	1.25	1.25	1.25	1.25
Iron bars, Philadelphia..	**1.22½**	1.17½	1.17½	1.17½
Iron bars, Pittsburgh....	1.25	1.25	1.20	1.25
Iron bars, Chicago.....	1.20	1.20	1.15	1.05
Steel bars, Pittsburgh...	1.20	1.20	1.20	1.10
Steel bars, New York....	1.369	1.369	1.369	1.26
Tank plates, Pittsburgh..	1.15	1.15	1.15	1.10
Tank plates, New York..	1.319	1.319	1.319	1.26
Beams, etc., Pittsburgh..	1.20	1.20	1.20	1.10
Beams, etc., New York..	1.369	1.369	1.369	1.26
Skelp, grooved steel, P'gh	1.15	1.15	1.15	1.15
Skelp, sheared steel, P'gh	1.20	1.20	1.20	1.20
Steel hoops, Pittsburgh..	1.30	1.30	1.25	1.25

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

Sheets, Nails and Wire, Per Lb. to Large Buyers:	June 23, 1915. Cents.	June 16, 1915. Cents.	May 26, 1915. Cents.	June 24, 1914. Cents.
Sheets, black, No. 28, P'gh.	1.75	1.75	1.75	1.80
Galv. sheets, No. 28, P'gh	5.00	5.00	3.75	2.75
Wire nails, Pittsburgh...	1.55	1.55	1.55	1.50
Cut nails, Pittsburgh....	1.55	1.55	1.55	1.55
Fence wire, base, P'gh...	1.35	1.35	1.35	1.30
Barb wire, galv., P'gh..	2.40	2.40	2.10	1.90
Metals, Per Lb. to Large Buyers.	Cents.	Cents.	Cents.	Cents.
Lake copper, New York..	22.50	22.50	21.00	14.12½
Electrolytic copper, N.Y.	*20.00*	20.37½	18.50	13.75
Spelter, St. Louis.....	*17.50*	21.50	18.75	4.90
Spelter, New York.....	*18.00*	22.00	19.00	5.05
Lead, St. Louis.....	*5.35*	7.00	4.22½	3.80
Lead, New York.....	*5.75*	7.00	4.30	3.90
Tin, New York.....	*41.25*	42.25	37.87½	30.75
Antimony, Hallett's, N. Y.	none	none	none	6.75
Tin plate, 100-lb. box, P'gh.	$3.10	$3.10	$3.15	$3.30
Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt....	$1.60	$1.60	$1.50	$1.75
Furnace coke, future....	1.75	1.75	1.65	1.85
Foundry coke, prompt...	2.00	2.00	2.00	2.30
Foundry coke, future....	2.25	2.25	2.15	2.50
Old Material, Per Gross Ton:				
Iron rails, Chicago.....	12.25	12.25	12.25	12.75
Iron rails, Philadelphia..	15.00	15.00	15.00	15.00
Carwheels, Chicago	**10.50**	10.25	9.75	11.50
Carwheels, Philadelphia..	11.50	11.50	11.50	11.00
Heavy steel scrap, P'gh..	11.75	11.75	11.75	11.50
Heavy steel scrap, Phila.	**11.25**	11.00	11.00	10.50
Heavy steel scrap, Ch'go.	**9.50**	9.25	9.50	9.75
No. 1 cast, Pittsburgh...	12.25	12.25	12.00	11.50
No. 1 cast, Philadelphia.	12.25	12.25	12.25	12.00
No. 1 cast, Ch'go (net ton)	9.00	9.00	9.00	9.75

Finished Iron and Steel f. o. b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16.9c.; Philadelphia, 15.9c.; Boston, 18.9c.; Buffalo, 11.6c.; Cleveland, 10.5c.; Cincinnati, 15.8c.,; Indianapolis, 17.9c.; Chicago, 18.9c.; St. Louis, 23.6c.; Kansas City, 43.6c.; Omaha, 43.6c.; St. Paul, 32.9c.; Denver, 68.6c.; New Orleans, 30c.; Birmingham, Ala., 45c.; Pacific coast, 80c. on plates, structural shapes and sheets No. 11 and heavier; 85c. on sheets Nos. 12 to 16; 95c. on sheets No. 16 and lighter; 65c. on wrought pipe and boiler tubes. The foregoing rates to the Pacific coast are by rail. The rate via New York and the Panama Canal has no stability, being dependent on vessel charges.

Plates.—Tank plates, ¼ in. thick, 6¼ in. up to 100 in. wide, 1.15c. base net cash, 30 days. Following are stipulations prescribed by manufacturers, with extras:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¼ in. and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per sq. ft., are considered ¼-in. plates. Plates over 72 in. wide must be ordered ¼ in. thick on edge or not less than 11 lb. per sq. ft., to take base price. Plates over 72 in. wide ordered less than 11 lb. per sq. ft. down to the weight of 3-16 in. take the price of 3-16 in.

Allowable overweight, whether plates are ordered to gauge or weight to be governed by the standard specifications of the Association of American Steel Manufacturers.

Extras	Cents per lb.
Gauges under ¼ in. to and including 3-16 in....	.10
Gauges under 3-16 in. to and including No. 8....	.15
Gauges under No. 8 to and including No. 9....	.25
Gauges under No. 9 to and including No. 10....	.30
Gauges under No. 10 to and including No. 12....	.40
Sketches (including straight taper plates), 3 ft. and over	.10
Complete circles, 3 ft. in diameter and over....	.20
Boiler and flange steel	.10
"A. B. M. A." and ordinary firebox steel	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive....	.05
Widths over 110 in. up to 115 in., inclusive....	.10
Widths over 115 in. up to 120 in., inclusive....	.15
Widths over 120 in. up to 125 in., inclusive....	.25
Widths over 125 in. up to 130 in., inclusive....	.50
Widths over 130 in	1.00
Cutting to lengths under 3 ft. to 2 ft., inclusive.	.25
Cutting to lengths under 2 ft. to 1 ft., inclusive.	.50
Cutting to lengths under 1 ft	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over.

Wire Products.—Prices to jobbers. Fence wire, Nos. 0 to 9, per 100 lb., terms 60 days or 2 per cent. discount in 10 days, carload lots, annealed, $1.35; galvanized, $2.15. Galvanized barb wire and staples, $2.40; painted, $1.60. Wire nails, $1.55. Galvanized nails, 1 in. and longer, $1.50 advance over base price; shorter than 1 in., $2 or more advance over base price. Woven wire fencing, 69 per cent. off list for carloads; 68 off for 1000-rod lots; 67 off for less than 1000-rod lots.

The following table gives the price to retail merchants on fence wire in less than carloads, with the extras added to the base price:

Plain Wire, per 100 lb.

Nos.	0 to 9	10	11	12&12½	13	14	15	16
Annealed	$1.50	$1.55	$1.60	$1.65	$1.75	$1.85	$1.95	$2.05
Galvanized	2.30	2.35	2.40	2.45	2.55	2.65	2.95	3.05

Wire Rods.—Bessemer, open-hearth and chain rods, $25.

Structural Material.—I-beams, 3 to 15 in.; channels, 3 to 15 in.; angles, 3 to 6 in. on one or both legs, ¼ in. thick and over, and zees, 3 in. and over, 1.20c. Extras on other shapes and sizes are as follows:

	Cents per lb.
I-beams over 15 in.	.10
H-beams over 18 in.	.10
Angles over 6 in., on one or both legs.	.10
Angles, 3 in. on one or both legs less than ¼ in. thick, as per steel bar card, Sept. 1, 1909.	.70
Tees, structural sizes (except elevator, handrail, car truck and conductor rail)	.05
Channels and tees, under 3 in. wide, as per steel bar card, Sept. 1, 1909.	.20 to .80
Deck beams and bulb angles	.30
Handrail tees	.75
Cutting to lengths under 3 ft. to 2 ft. inclusive.	.25
Cutting to lengths, under 2 ft. to 1 ft. inclusive.	.50
Cutting to lengths, under 1 ft.	1.55

No charge for cutting to lengths 3 ft. and over.

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card in effect from June 17, 1915, all full weight:

Butt Weld

Steel Inches	Black	Galv.	Iron Inches	Black	Galv.
⅛, ¼ and ⅜	72	40½	⅛ and ¼	64	31
½	76	53½	⅜	64	31
¾ to 3	79	57½	½	68	41
			¾ to 2½	71	46

Lap Weld

2	76	54½	1¼	55	30
2½ to 6	78	56½	1½	66	41
7 to 12	76	54½	2	67	43
13 and 14	62½	....	2½ to 4	69	46
15	60	....	4½ to 6	69	46
			7 to 12	67	46

Reamed and Drifted

1 to 3, butt	77	55½	1 to 1½, butt	69	44
2, lap	74	52½	2, butt	69	44
2½ to 6, lap	76	54½	1¼, lap	53	28
			1½, lap	64	39
			2, lap	65	41
			2½ to 4, lap	67	44

Butt Weld, extra strong, plain ends

⅛, ¼ and ⅜	67	43½	⅜	61	37
½	72	52½	½	66	45
¾ to 1½	76	56½	¾ to 1½	70	47
2 to 3	77	57½	2 and 2½	71	48

Lap Weld, extra strong, plain ends

2	73	51½	1½	65	42
2½ to 4	75	53½	2	67	43
4½ to 6	74	52½	2½ to 4	69	46
7 to 8	68	46½	4½ to 6	68	45
9 to 12	63	41½	7 to 8	61	40
			9 to 12	56	35

Butt Weld, double extra strong, plain ends

½	62	42½	½	56	34
¾ to 1½	65	45½	¾ to 1½	59	37
2 to 2½	67	47½	2 and 2½	61	39

Lap Weld, double extra strong, plain ends

2	63	43½	2	57	34
2½ to 4	65	45½	2½ to 4	59	39
4½ to 6	64	44½	4½ to 6	58	38
7 to 8	58	36½	7 to 8	51	29

To the large jobbing trade an additional 5 per cent. is allowed over the above discounts.

The above discounts are subject to the usual variation in weight of 5 per cent. Prices for less than carloads are two (2) points lower basing (higher price) than the above discounts on black and three (3) points on galvanized.

Boiler Tubes.—Discounts on less than carloads, f.o.b. Pittsburgh, freight to destination added, in effect from June 15, 1915, are as follows:

Lap Welded Steel		*Standard Charcoal Iron*	
1¾ and 2 in.	64	1¾ and 2 in.	51
2¼ in.	61	2¼ in.	48
2½ to 2¾ in.	67	2½ and 2¾ in.	55
3 and 3¼ in.	72	3 and 3¼ in.	59
3½ and 4½ in.	73	3½ and 4½ in.	61
5 and 6 in.	66	5 and 6 in.	55
7 to 13 in.	63		

Locomotive and steamship special charcoal grades bring higher prices.

1¾ in., over 18 ft., 10 per cent. net extra.

2 in. and larger, over 22 ft., 10 per cent. net extra.

Sheets.—Makers' prices for mill shipment on sheets of U. S. Standard gauge, in carload and larger lots, on which jobbers charge the usual advance for small lots

from store, are as follows, f.o.b. Pittsburgh, terms 30 days net, or 2 per cent. cash discount in 10 days from date of invoice:

Blue Annealed Sheets

	Cents per lb.
Nos. 3 to 8	1.25 to 1.30
Nos. 9 to 10	1.30 to 1.35
Nos. 11 and 12	1.35 to 1.40
Nos. 13 and 14	1.45 to 1.50
Nos. 15 and 16	1.55 to 1.60

Box Annealed Sheets, Cold Rolled

	Cents per lb.
Nos. 10 and 11	1.40 to 1.45
No. 12	1.40 to 1.45
Nos. 13 and 14	1.45 to 1.50
Nos. 15 and 16	1.50 to 1.55
Nos. 17 to 21	1.55 to 1.60
Nos. 22 and 24	1.60 to 1.65
Nos. 25 and 26	1.65 to 1.70
No. 27	1.70 to 1.75
No. 28	1.75 to 1.80
No. 29	1.80 to 1.85
No. 30	1.90 to 1.95

Galvanized Sheets of Black Sheet Gauge

	Cents per lb.
Nos. 10 and 11	4.00 to 4.50
No. 12	4.10 to 4.60
Nos. 13 and 14	4.10 to 4.60
Nos. 15 and 16	4.20 to 4.70
Nos. 17 to 21	4.35 to 4.85
Nos. 22 and 24	4.55 to 4.95
Nos. 25 and 26	4.70 to 5.20
No. 27	4.85 to 5.35
No. 28	5.00 to 5.50
No. 29	5.10 to 5.60
No. 30	5.25 to 5.75

Pittsburgh

PITTSBURGH, PA., June 22, 1915.

Pig iron, scrap and coke have not yet improved as they should in sympathy with the generally better market on finished iron and steel products. Pig iron is in better demand, but prices are not more than 25c. a ton higher than they were January 1, when general conditions were not nearly so favorable as they are now. Scrap and coke are both selling at practically the same prices as at the first of the year. Conditions in the finished iron and steel trades seem to be getting better steadily, there being greater activity from week to week. The Carnegie Steel Company has issued orders to start its open-hearth works at Sharon, Pa., and may start its Bessemer plant at Columbus, Ohio, both of which have been idle for more than two years. The company will then be operating all its steel works and very close to 100 per cent. of capacity. The company also expects to start three or four more blast furnaces within the next month. There is a very large foreign inquiry for sheets, tin plate, barb and plain wire and wire nails, and heavy shipments are continuously being made abroad. The decline of about 11c. per lb. in the price of spelter in the past two weeks means that there probably will not be any further advances in galvanized products unless it should start up again. Probably the greatest activity is in steel billets and sheet bars, and prices are slightly higher. Scrap continues dull, with prices rather weak.

Pig Iron.—The Colonial Steel Company is about to close with a local interest for 10,000 tons of basic iron for delivery over the remainder of the year. Another steel company, which is a producer of pig iron, is inquiring for a round lot of basic for second half. The Shenango Furnace Company has sold 6000 tons of standard Bessemer iron for shipment to Italy, deliveries to be made as fast as possible. It sold about 8000 tons of Bessemer some time ago for shipment to the same country. We note a sale of 500 tons of Northern No. 2 foundry iron for July-August-September delivery, at about $12.50, Valley furnace. Present inquiry for pig iron is light, as most consumers seem to be covered for some time ahead. We quote: Bessemer iron, $13.75; malleable Bessemer, $12.60 to $12.75; No. 2 foundry, $12.50 to $12.75; basic, $12.65 for July and August, and $12.75 to $12.80 for delivery over second half of the year; gray forge, $12.40 to $12.50, all at Valley furnace, with a freight rate of 95c. per ton for delivery in the Cleveland and Pittsburgh districts.

Billets and Sheet Bars.—The demand for both billets and sheet bars is very active, and a decided shortage in supply of open-hearth steel has developed. It is predicted that billets and sheet bars will be higher in the latter part of the year than they are now. Specifications against contracts are reported very active. We quote: Bessemer and open-hearth billets, $19.50 to $20, and Bessemer and open-hearth sheet bars, $20.50 to $21, f.o.b. maker's mills, Youngstown; Bessemer and open-hearth billets, $21, and Bessemer and open-hearth sheet bars, $22, f.o.b. Pittsburgh. Forging billets are quoted at $27 for sizes up to but not including 10 x 10 in., and for carbons up to 0.25, the regular extras being charged for larger sizes and lighter carbons. Forging billets running above 0.25 to 0.60 carbon take $1 per ton extra. Axle billets are held at $23.

Ferroalloys.—Reports that ferromanganese had been sold for prompt delivery at as high as $115 are denied here, several local dealers stating they will sell 80 per cent. English from stock at $105, delivered. In fact, several sales of carloads and larger amounts were made recently at $102.50 and $105 delivered in this district. The Pittsburgh Crucible Steel Company, which had an inquiry out for 400 tons, has decided not to contract for the present, but will probably buy from month to month. English makers quote $100, seaboard, but give no guarantee as to deliveries, so that consumers who have to buy are picking up odd lots from stock. We quote English 80 per cent. ferromanganese for prompt delivery from stock at $105, delivered Pittsburgh. We quote 50 per cent. ferrosilicon in lots up to 100 tons, at $73; over 100 tons to 600 tons, $72; and over 600 tons, $71, delivered in the Pittsburgh district. We quote 10 per cent. ferrosilicon at $17; 11 per cent., $18; 12 per cent., $19, all f.o.b. cars at furnace, Ashland, Ky., Jackson or New Straitsville, Ohio, each of these points having a rate to Pittsburgh of $2 per gross ton. We quote 20 per cent. spiegeleisen at $25 at furnace. We quote ferrotitanium at 8c. per lb. in carloads, 10c. in 2000-lb. lots and over, and 12½c. in smaller lots.

Structural Material.—Inquiry is reported more active, but no large jobs were closed in this district in the past week. The Massillon Bridge Company, Massillon, Ohio, took 390 tons for a market house at Cleveland; the Cambria Steel Company, about 400 tons for the East Liberty Theater in this city, and the Jones & Laughlin Steel Company, 500 tons for St. Mary's College, Emmettsburg, Md. We quote beams and channels up to 15 in. for third quarter and last half delivery at 1.25c., f.o.b. Pittsburgh.

Plates.—The Standard Steel Car Company of this city, which owns the Middletown Car Company, Middletown, Pa., will furnish 2500 of the cars ordered by France and the Canadian Car & Foundry Company 1000. The cars are of the 10 and 20 ton capacity and are of the flat and box types. The Cambria Steel Company has taken 400 steel ore cars for the Lake Superior & Ishpeming Railroad. No large inquiries are in the market for cars, but it is persistently stated that the New York Central and the Baltimore & Ohio will send out inquiries before long for a large number of cars. The current demand for plates is better. It is believed the market will be quite firmly established at 1.20c. early in July. The larger plate mills are quoting 1.25c. for third quarter, and state they will hold to that price.

Steel Rails.—It develops that the 100-lb. sections of the Pennsylvania Railroad order for rails will be rolled from one specification and will bring a slightly higher extra than the 125-lb. sections, which will be rolled from another specification. As yet the orders for the Pennsylvania rails have not reached the mills, but are expected early in July. The domestic demand for standard sections is quiet and no large inquiries are out. The demand for light rails is active, the coal mining and traction companies placing quite liberal orders. Prices on light rails rolled from billets are firmer, and the rerolling light rail mills are also quoting slightly higher figures. We quote standard section rails of Bessemer stock at 1.25c., and of open-hearth, 1.34c., f.o.b. Pittsburgh. We quote light rails as follows, in carload lots: 8 and 10 lb. sections, 1.275c.; 12 and 14 lb., 1.225c.; 16 and 20 lb., 1.175c.; 25, 30, 35, 40 and 45 lb. sections, 1.125c. The prices of light rails are materially shaded on large lots.

Sheets.—As yet it is not known what effect the drop in prices of spelter will have on galvanized sheets and other galvanized products. The American Sheet & Tin Plate Company is still taking care of its customers as much as possible on galvanized sheets on the basis of 5c. for No. 28, and some other mills report sales from stock as high as 5.50c. Some mills that stopped making galvanized sheets will probably get back to making them again if the price of spelter should get down to about 15c. There is quite an active foreign demand and some fairly heavy export shipments are being made. Mills as a rule are operating from 75 to 80 per cent. of capacity. We quote No. 28 Bessemer black sheets at 1.75c. to 1.80c.; No. 28 galvanized, 5c. to 5.50c.; Nos. 9 and 10 blue annealed sheets, 1.30c. to 1.35c.; No. 30 black plate, tin-mill sizes, H. R. & A., 1.95c.; No. 28, 1.90c.; Nos. 27, 26 and 25, 1.85c.; Nos. 22 to 24, 1.80c.; Nos. 17 to 21, 1.75c.; Nos. 15 and 16, 1.70c. The above prices are for carload lots, f.o.b. at maker's mill, jobbers charging the usual advances for small lots from store.

Tin Plate.—The foreign demand for tin plate continues very heavy and some large shipments are being made, mostly to England and Russia. It is believed that part of the tin plate that England is buying is for delivery to France. The domestic demand is also more active, and prices are firm. It is said that on foreign business as high as $3.40 per base box has been paid. The mills are running close to 100 per cent. of capacity, and specifications are heavy. On new orders we quote 14 x 20 coke plates at $3.10 to $3.25 per base box, prices depending on the size of the order and deliveries wanted.

Wire Rods.—Nearly all domestic consumers are covered over the remainder of the year, and new buying is light, but there is still a heavy foreign demand and sales for such delivery are frequent. One local mill is shipping probably 20 per cent. of its output of rods abroad. We quote Bessemer, open-hearth and chain rods at $25 to $26, while nothing less than $26 is being quoted for foreign shipment.

Carwheels.—No recent large orders have been placed, but it is stated that the steel carwheel plants are pretty well filled for a considerable time ahead. Deliveries on the carwheels for the Pennsylvania Railroad cars will probably not start before August. We quote standard 33-in. freight carwheels 6¼ in. rough bore at $16, and standard 36-in. passenger, the same bore, at $22.50 per wheel, f.o.b. Pittsburgh.

Shafting.—Makers report the demand for shafting for screw stock and also from the automobile trade as very heavy. The demand in fact is up to capacity or larger. Some of the implement makers have made contracts for their supply of shafting for last half of the year. The advance in steel bars to 1.25c. for third quarter has firmed up shafting prices, and 68 per cent. off is now regarded as minimum on large orders. The Columbia Steel & Shafting Company of this city has lowered discounts two points and is now quoting 66 per cent. off in carloads and larger lots, and 61 per cent. in less than carload lots. We quote cold-rolled shafting at 66 to 68 per cent. off in carloads and 61 to 63 per cent. in less than carloads, f.o.b. Pittsburgh.

Railroad Spikes.—Makers state that specifications are coming in at a good rate. The Baltimore & Ohio has an inquiry out for about 10,000 kegs of spikes. We quote standard sizes of railroad spikes at $1.40 minimum, and small railroad and boat spikes at $1.50 per 100 lb., f.o.b. Pittsburgh.

Hoops and Bands.—The mills have booked heavy orders for hoops and bands for third quarter delivery, and two leading makers are now quoting 1.25c. for third quarter and last half. Specifications against contracts are stated to be coming in quite freely. We quote steel bands at 1.25c. for delivery in third quarter and last half, with extras as per the steel bar card, and steel hoops at 1.30c. to 1.35c., f.o.b. Pittsburgh. It is stated that in a few cases, on very desirable contracts, 1.25c. on steel hoops is being named by one or two makers.

Wire Products.—Prices on wire nails and wire are firmer, and it is believed the market will soon be on the basis of $1.60 for wire nails and $1.40 for plain wire. The domestic demand is seasonable and the mills report their foreign demand for barb and plain wire and also for wire nails as still very large, and export shipments are heavy. Mills are turning down nearly every day new barb wire inquiries on which they cannot make the deliveries wanted. There has been no further advance in galvanized products, but prices are very tight. To jobbers on new orders the mills quote wire nails, $1.55; galvanized nails, 1 in. and longer taking an advance over this price of $1.50, and shorter than 1 in., $2 or more. Plain annealed wire is $1.35 to $1.40; galvanized barb wire and fence staples, $2.40; painted barb wire, $1.60; all f.o.b. Pittsburgh, with freight added to point of delivery, terms 30 days net, less 2 per cent. off for cash in 10 days. Prices on woven wire fencing are higher, and it is now quoted at 69 per cent. off in carload lots, 68 per cent. on 1000-rod lots, and 67 per cent. on small lots, f.o.b. Pittsburgh.

Skelp.—Some heavy sales of grooved and sheared iron skelp have been made in this market in the past week. Mills are well filled and indications favor higher prices in the near future. We continue to quote grooved steel skelp at 1.15c. to 1.20c.; sheared steel skelp, 1.20c. to 1.25c.; grooved iron skelp, 1.60c. to 1.65c., and sheared iron skelp, 1.70c. to 1.75c., delivered to consumers' mills in the Pittsburgh district. An order for 5000 tons or more of grooved steel skelp was placed here recently at 1.15c., and there have been sales of 5000 to 6000 tons of iron skelp at 1.60c. for grooved and close to 1.75c. for sheared. It would take a very nice specification to bring out 1.15c. for grooved and 1.20c. for sheared steel skelp.

Iron and Steel Bars.—The local market on steel bars seems firmly established at 1.25c. for third quarter and last half. Local mills are back in deliveries from three to four weeks. The Carnegie Steel Company has taken heavy additional orders for steel rounds, and has its steel-bar capacity employed to 100 per cent. Implement makers, wagon builders and other large users of steel bars fully realize the situation, and are now said to be anxious to cover for last half of the year at the 1.20c. price named to these consumers some time ago. It is said that most of the small implement makers and nearly all of the large ones have already covered on their needs for last half of this year and that a few of the contracts call for delivery in first half of next year. Indications are that the steel-bar mills will run to full capacity over the remainder of this year. The new demand for common iron bars is more active and prices are firm. We quote steel bars at 1.25c., for third quarter; common iron bars at 1.25c. to 1.30c., and test iron bars 1.35c. to 1.40c., f.o.b. Pittsburgh.

Cold-Rolled Strip Steel.—Makers report a very active domestic demand, and there is also considerable foreign inquiry, some business of the latter kind having been closed recently. Prices are very firm, and are expected to be higher in the near future if present active demand continues. We quote hand-rolled steel, 1½ in. and wider, under 0.20 carbon, sheared or natural mill edge, per 100 lb., $2.75, delivered. Extras, which are standard among all the mills, are as follows:

Thickness, in.	Extras for thickness	Extras for soft or intermediate tempers	Extras for straightening and cutting to lengths not less than 24 in.
0.100 and heavier	Base	$0.25	$0.10
0.099 to 0.050	$0.05	0.25	0.15
0.049 to 0.035	0.20	0.25	0.15
0.034 to 0.031	0.35	0.40	0.25
0.030 to 0.025	0.45	0.40	0.40
0.024 to 0.020	0.55	0.40	0.50
0.019 to 0.017	0.85	0.50	1.10
0.016 to 0.015	1.25	0.50	1.10
0.014 to 0.013	1.95	0.50	1.25
0.012	2.30	0.50	coils only
0.011	2.65	0.50	coils only
0.010	3.00	0.50	coils only

Merchant Steel.—Specifications against contracts are coming in very freely, the new demand is active, and shipments by the mills are heavy. Prices are firm

and in small lots are as follows: Iron finished tire, ½ x 1½ in. and larger, 1.40c., base; under ½ x 1½ in., 1.55c.; planished tire, 1.60c.; channel tire, ¾ to ⅞ and 1 in., 1.90c. to 2c.; 1⅛ in. and larger, 2c.; toe calk, 2c. to 2.10c., base; flat sleigh shoe, 1.75c.; concave and convex, 1.80c.; cutter shoe, tapered or bent, 2,30c. to 2.40c.; spring steel, 2c. to 2.10c.; machinery steel, smooth finish, 1.80c.

Rivets.—The new demand for both boiler and structural rivets is more active now than at any time in more than a year. Prices are firm and show signs of being higher in the near future. We quote structural rivets at $1.50, and conehead boiler rivets at $1.60 per 100 lb. in carload lots, f.o.b. Pittsburgh, smaller lots bringing from 5c. to 10c. advance, depending on the order.

Nuts and Bolts.—Makers report the new demand fairly active, but most large consumers are now covered by contracts over the second half. They are specifying freely. Prices are firm. Discounts to the large trade are as follows:

U. S. S. Cold Punched Blank and Tapped, Chamfered, Trimmed and Reamed

½ in. and smaller, hex.....8.1c. per lb. off
⅝ in. and larger, hex.....7.3c. per lb. off
Square, all sizes .....5.8c. per lb. off

Semi-Finished Tapped

½ in. and smaller hex.....85-10-10-10 off
⅝ in. and larger hex.....85-10-10 off

Black Bulk Rivets

7/16 x 6½, smaller and shorter.....80-10-5 off

Package Rivets 1000 *Pcs.*

Black, metallic tinned and tin plated....75-10-10 off

Discounts on bolts as recently adopted are as follows:

Common carriage bolts, ⅜ x 6, S & S rolled, 80-5; cut, 80; larger or longer, 75-5. Machine bolts, h. p. nuts, ⅜ x 4, S & S rolled, 80-5; cut, 80; larger or longer, 75-2/10. Machine bolts with C. P. & C & T nuts, ⅜ x 4, S & S, 75-2/10; larger or longer, 75. Bolts without nuts, 6 in. and shorter extra 10%; longer lengths, extra 5%. G. P. coach screws, 75-2/10-5. Nuts, blank or tapped, h. p. square, 6.20; hexagon, 7.10. C. P. C & T square, 5.80; hex. ⅝ in. and up, 7.30; smaller, 8.1. C. P. plain, square, 5.30; hexagon, 5.70. C. P., semi-fin. hex., ⅝ and up, 85-3/10; smaller, 85-2/10.

Wrought Pipe.—So far this month the new demand for tubular goods has been slightly heavier than in May. There is an active demand for galvanized pipe, and several mills are insisting on customers placing their orders on the basis of 60 per cent. black and 40 per cent. galvanized, and this has helped the demand for black pipe considerably. The Gulf Refining Company of this city has placed an order for 60 miles of 6-in. pipe with the Wheeling Steel & Iron Company, Wheeling, W. Va., and the Central Kansas Gas Company has placed an order with a Western mill for 25 miles of 6 and 8 in. line pipe. Prices are firm.

Boiler Tubes.—Several large contracts for boiler tubes have been closed by local mills recently, and the general demand for locomotive and merchant tubes is heavier than for a long time. It is stated that the new discounts on steel and iron boiler tubes, given on a previous page, are firmly maintained.

Coke.—The Wheeling Steel & Iron Company has closed with a local interest for 6000 to 7000 tons of furnace coke per month over the remainder of this year at $1.70 per net ton at oven, or slightly under. The Pittsburgh Steel Company has also contracted with a local interest for its supply of coke for several months, about 20,000 tons per month, but has not yet bought for the entire year. The coke business, however, is not very active, as few blast furnaces that buy coke have started up recently, the increase being among steel companies' blast furnaces that have their own coke. No large inquiries for furnace coke are in the market at present. The new demand for foundry coke is more active and some contracts are being made. We quote best grades of blast furnace coke at $1.55 to $1.60 for prompt shipment, and $1.70 to $1.75 per net ton at oven for delivery over remainder of the year. We quote best makes of 72-hour foundry coke for prompt shipment at $2 to $2.25, and on contracts from $2.25 to $2.50, per net ton at oven. Some grades of furnace and foundry coke are sold at slightly less than the above prices. The Connellsville Courier gives the output of coke in the upper and lower Connellsville regions for the week ended June 12 as 334,514 net tons, an increase over the previous week of 20,000 tons, and the heaviest output in any one week for nearly two years.

Old Material.—As yet neither the demand nor prices for scrap have responded to the general betterment in the market for finished steel products. Most consumers have heavy stocks of scrap. There is some demand for low phosphorus melting stock, and borings and turnings. We note a sale of 400 tons of turnings at about $8.25; 300 tons of borings at about $8.50, delivered, and 3000 to 4000 tons of heavy steel scrap at $11.75 delivered. For delivery in Pittsburgh and nearby districts that take Pittsburgh freights, dealers quote about as follows:

Heavy steel melting scrap, Steubenville, Follansbee, Brackenridge, Sharon, Monessen, Midland and Pittsburgh delivery	$11.75
Compressed side and end sheet scrap	$10.25 to 10.50
No. 1 foundry cast	12.25 to 12.50
Bundled sheet scrap, f.o.b. consumers' mills, Pittsburgh district	9.25 to 9.50
Rerolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa.	11.75 to 12.00
No. 1 railroad malleable stock	10.50 to 10.75
Railroad grate bars	8.50 to 8.75
Low phosphorus melting stock	15.25 to 15.50
Iron car axles	18.75 to 19.25
Steel car axles	13.25 to 13.75
Locomotive axles, steel	19.75 to 20.25
No. 1 busheling scrap	10.25 to 10.50
No. 2 busheling scrap	7.25 to 7.50
Machine shop turnings	8.00 to 8.25
Old carwheels	11.75 to 12.00
Cast-iron borings	8.50 to 8.75
*Sheet bar crop ends	12.00 to 12.25
Old iron rails	12.75 to 13.00
No. 1 railroad wrought scrap	10.75 to 11.00
Heavy steel axle turnings	8.50 to 8.75
Heavy breakable cast scrap	10.75 to 11.00

*Shipping point.

Chicago

CHICAGO, ILL., June 23, 1915.—(*By Wire.*)

June sales and specifications for plates, shapes and bars greatly exceed the bookings of the similar period in May. Contracting among the rank and file of manufacturers for steel to be delivered in the third quarter is decidedly more active, and for the first time in a long period is to a degree spontaneous in character. The signs of a definite improvement can no longer be mistaken. Recent car orders are behind a large proportion of this steel buying. A single order for 20,000 tons of steel from one carbuilder is typical. Car construction now on the programs of Western shops involves an aggregate of steel shapes, plates, axles and bars that will approximate 125,000 tons. Added to this, other railroad purchases for track and bridges since June 1 in this market total nearly 45,000 tons, while the long-drawn-out bargaining between the mills and the implement interests has been brought to a conclusion in the instances of the most important contracts. It is generally accepted that while the condition of a six months' limitation of contracts has been in a manner recognized, the larger manufacturers at least have been able to protect their requirements from July to July. Of this, interesting evidence is had in the failure of one of the leading bar makers to participate in these contracts. With the exception of one important interest the quotation of 1.25c., Pittsburgh, for principal steel products for third quarter appears to have become general. That exception represents the quotations which still may be found in connection with third quarter contracts at 1.20c. for shapes and bars and 1.15c. for plates. Current orders are being taken at prices $1 a ton below the maximum. The production of black sheets grows heavier in response to an increasing demand, but the sudden drop in the price of spelter last week is the first deviation from its upward flight and may operate to restore more normal conditions for galvanized products. Implement contracting for bolts and nuts was likewise a feature of the past week. A logical development in connection with an otherwise unimportant pig-iron market is the appearance of a number of inquiries for malleable iron ag-

gregating several thousand tons from makers of railroad equipment.

Pig Iron.—The pig-iron market, while lacking any very definite tendency, presents a somewhat larger range of inquiry. The major portion of these negotiations, including two lots of 2000 tons each and involving the needs of a large manufacturer of railroad equipment castings, concerns malleable iron, as might be anticipated in connection with recent buying of cars. Other inquiry for charcoal and foundry iron is reported. The buying thus in contemplation will cover deliveries both in third and fourth quarter. The current situation seems not to be bringing into question the matter of prices to any extent which might be considered unsettling, and we continue to quote prices without change. The following quotations are for iron delivered at consumers' yards, except those for Northern foundry, malleable Bessemer and basic iron, which are f.o.b. furnace, and do not include a switching charge averaging 50c. a ton:

Lake Superior charcoal, Nos. 2 and 3	$15.75
Lake Superior charcoal, Nos. 1, 4 and 5	16.25
Lake Superior charcoal, No. 6 and Scotch	16.75
Northern coke foundry, No. 1	$13.50 to 13.75
Northern coke foundry, No. 2	13.00 to 13.50
Northern coke foundry, No. 3	12.50 to 13.00
Southern coke, No. 1 f'dry and 1 soft	14.25 to 14.50
Southern coke, No. 2 f'dry and 2 soft	13.75 to 14.00
Malleable Bessemer	13.00 to 13.25
Standard Bessemer	16.50
Basic	12.50 to 13.00
Low phosphorus	20.00 to 20.50
Jackson Co. and Ky. silvery, 8 per cent.	16.50 to 17.00
Jackson Co. and Ky. silv'y, 10 per cent.	17.50 to 18.00

(*By Mail*)

Rails and Track Supplies.—The Pennsylvania rails have not yet been entered at Chicago for rolling, and the tonnage to be placed here is still unknown. Specifications since June 1 have been sufficient to keep the Gary rail mill in fairly steady operation on one turn. In the past three weeks nearly 15,000 tons of tie plates have been specified in this market, and a general firming up in the price of spikes and bolts, to the extent of about $1 a ton, is indicative of a better mill situation in these products. We quote standard railroad spikes at 1.50c., base; track bolts with square nuts, 1.90c., base, all in carload lots, Chicago; tie plates, $23.25 to $24.25 f.o.b. mill, net ton; standard section Bessemer rails, Chicago, 1.25c., base; open-hearth, 1.34c.; light rails, 25 to 45 lb., 1.07c.; 16 to 20 lb., 1.12c.; 12 lb., 1.17c.; 8 lb., 1.22c.; angle bars, 1.50c., Chicago.

Structural Material.—Recent car orders placed in this market have brought to local mills a sufficient tonnage of structural steel to exert a noticeable influence upon the market. One car builder last week placed its order for 20,000 tons of steel. The distribution of the 4000 box cars by the Chicago, Rock Island & Pacific—2500 to the Pullman Company, 1000 to the Bettendorf Axle Company and 500 to the Haskell & Barker Car Mfg. Company—is responsible for the booking of between 25,000 and 30,000 tons of steel in the form of structural shapes and axles. Orders have come to local mills within the past ten days covering steel for the 1500 Pennsylvania cars which the Western Steel Car & Foundry Company will build and 2500 which Haskell & Barker have. This latter company is also understood to have taken 500 steel ore cars for a northern Michigan railroad, the aggregate involved closely approaching 6000 tons. A car buying movement appears to have been inaugurated, and we note the inquiry of the Omaha for 1000 cars as well as a tentative inquiry from another road for 2000. Building operations have been less productive, and in Chicago there is scarcely an architectural project in sight, although the report of a new Board of Trade building is again current. Bids will be asked soon for the new bridge at Twelfth street. Other contracts reported placed last week include 318 tons taken by the Kenwood Bridge Company for a new plant of the Wisconsin Zinc Company; 585 tons awarded to the Federal Bridge Company for Milwaukee Railroad bridge spans; 322 tons to the American Bridge Company for additions to the American Car & Foundry Company's Chicago works, and 340 tons to the Northwest Steel Company for the First National Bank building at Portland, Ore. With only one exception all mills are now quoting in this territory for third quarter contracts on the basis of 1.25c., Pittsburgh, but for prompt shipment 1.20c. continues to rule, although at least two Eastern mills have no price better than 1.25c. to offer for any business. We quote for Chicago delivery from mill 1.389c. to 1.439c.

Some of the fabricators of this district report quotations from jobbers on mill orders for immediate shipment as low as 1.15c., Pittsburgh, and it is stated that some business has been placed. Steel out of stock is moving only moderately well. We quote for Chicago delivery from store 1.75c.

Plates.—Orders from car builders have augmented the available plate tonnage in this market to such an extent that, for third quarter, plates are being quoted on the same basis as bars and shapes, for the first time in many months. This sharp advance is not entirely general, as the average contract now being placed is at a minimum of 1.15c., Pittsburgh. A desirable order for shipment during the remainder of this month, it is stated, can still be placed at 1.10c. Plate specifications received by one local mill, thus far in June, were at a daily average exceeding that of May by nearly 70 per cent. We quote for Chicago delivery of plates from mill 1.289c. to 1.339c.

We quote for Chicago delivery of plates from store 1.75c.

Sheets.—With a drop of fully 10c. per lb. in the price of spelter, the outlook for the re-establishment of galvanized sheets upon a commercially possible basis is more hopeful. In this market, while there has been some galvanized tonnage moving continuously buying has reached a minimum, and even the manufacturers of culverts and small tanks are now using black sheets, substituted for galvanized. The mill at Indiana Harbor is operating 12 out of 18 of its sheet mills on black sheets and the period of extreme concessions, existent for a time, has passed. We quote for Chicago delivery from mill: No. 10 blue annealed, 1.489c.; No. 28 black, 1.939c.; No. 28 galvanized, 5.15c. to 5.439c.

We quote for Chicago delivery from jobbers' stocks as follows, minimum prices applying on bundles of 25 or more: No. 10 blue annealed, 1.95c.; No. 28 black, 2.55c.; No. 28 galvanized, 4.85c.

Bars.—Negotiations with Western implement manufacturers covering their steel-bar requirements appear to have been completed in the majority of instances, including the tonnage of greatest importance. It is an open secret that, while a number of smaller contracts were held to the period of six months, arrangements entered into between most of the steel companies and the large buyers provide for the full year's requirements, and that the only mill which has rigidly adhered to the six months' contract policy has taken but little implement business this year, although ordinarily an important factor. The weakness of reinforcing bars, as contrasted with the strength of steel bars generally, continues one of the interesting phases of the market. A number of inquiries are noted, including 500 tons for the Ford Motor Company's building at Milwaukee and 3000 tons for cotton warehouses at New Orleans. The price of bar iron holds firm despite the very limited tonnage coming out. We quote for mill shipments as follows: Bar iron, 1.20c.; soft steel bars, 1.389c.; hard steel bars, 1.20c.; shafting, in carloads, 65 to 68 per cent. off; less than carloads, 60 per cent. off.

We quote store prices for Chicago delivery: Soft steel bars, 1.65c.; bar iron, 1.65c.; reinforcing bars, 1.65c. base, with 5c. extra for twisting in sizes ½ in. and over and usual card extras for smaller sizes; shafting 60 per cent. off, and in carloads, 62 per cent. off.

Rivets and Bolts.—Contracts for implement bolts were closed last week in a number of important instances, and with this business secured the market appears to be established with firmness on the present basis. A number of contracts for rivets for third quarter have also been made, some of them at the recent advance in price. Quotations are as follows: Carriage bolts up to ⅝ x 6 in., rolled thread, 80-10; cut thread, 80-5; larger sizes, 75-15; machine bolts up to ⅝ x 4 in., rolled thread, with hot pressed square nuts, 80-15;

cut thread, 80-10; larger sizes, 80; gimlet point coach screws, 85; hot pressed nuts, square, $6.40 off per cwt.; hexagon, $7.30 off per cwt. Structural rivets, ¾ to 1¼ in., 1.65c., base, Chicago, in carload lots; boiler rivets, 10c. additional.

We quote out of store: Structural rivets, 2c.; boiler rivets, 2.10c.; machine bolts up to ⅝ x 4 in., 75-15; larger sizes, 70-10-10; carriage bolts up to ⅝ x 6 in., 75-10; larger sizes, 70-15 off; hot pressed nuts, square, $6, and hexagon, $6.70 off per cwt.

Wire Products.—Wire is moving in the rather desultory fashion normal at this season. The wire mills are preparing for their mid-summer cut-down, some of them to be off for a period of 10 days. We quote to jobbers as follows: Plain wire, No. 9 and coarser, base, $1.589; wire nails, $1.739; painted barb wire, $1.789; galvanized barb wire, $2.539; polished staples, $1.789; galvanized staples, $2.539; all Chicago.

Cast-Iron Pipe.—At Kenosha, Wis., all bids on the 2500 tons of pipe which it was proposed to buy have been rejected, and it is understood that a new plan, involving a filtration plant, is contemplated. At Cincinnati, 2000 tons has been awarded to the United States Cast Iron Pipe & Foundry Company, which interest has also taken 1000 tons of 16-in. pipe at Berwyn, Ill. Prices of pipe are slightly higher and we advance our quotations 50c. per ton. We quote as follows, per net ton, Chicago: Water pipe, 4 in., $26; 6 to 12 in., $24; 16 in. and up, $23.50, with $1 extra for Class A water pipe and gas pipe.

Old Material.—The week saw some buying of heavy melting steel, sufficient to establish the market at a somewhat higher figure than was previously quoted, sales at $9.50 and $9.75 being reported. A limited activity in foundry grades and several purchases of carwheels are also noted. Rolling-mill scrap is neither in great demand nor freely offered, the mills being content to maintain their reserves with operations very light, and the dealers seemingly disposed to sell only such scrap as cannot be easily held. The market tone is slightly firmer. Further railroad offerings of scrap include 3000 tons from the Rock Island, 3000 tons from the Burlington, 2600 tons from the Omaha and small lists from the Alton, the New York Central and the Chicago & Eastern Illinois. We quote for delivery at buyers' works, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton

Old iron rails	$12.25 to $12.50
Old steel rails, rerolling	10.25 to 10.75
Old steel rails, less than 3 ft.	10.00 to 10.50
Relaying rails	19.50 to 20.50
Old carwheels	10.50 to 10.75
Heavy melting steel scrap	9.50 to 9.75
Frogs, switches and guards, cut apart	9.50 to 9.75
Shoveling steel	9.00 to 9.25
Steel axle turnings	7.00 to 7.25

Per Net Ton

Iron angles and splice bars	$11.50 to $12.00
Iron arch bars and transoms	12.00 to 12.50
Steel angle bars	8.50 to 8.75
Iron car axles	13.50 to 14.00
Steel car axles	10.00 to 10.50
No. 1 railroad wrought	9.00 to 9.25
No. 2 railroad wrought	8.25 to 8.75
Cut forge	8.25 to 8.75
Steel knuckles and couplers	8.50 to 8.75
Steel springs	9.00 to 9.25
Locomotive tires, smooth	8.50 to 9.00
Machine shop turnings	5.00 to 5.50
Cast borings	5.00 to 5.50
No. 1 busheling	7.25 to 7.50
No. 2 busheling	6.00 to 6.50
No. 1 boilers, cut to sheets and rings	5.50 to 6.00
Boiler punchings	8.25 to 8.50
No. 1 cast scrap	9.00 to 9.50
Stove plate and light cast scrap	8.00 to 8.25
Grate bars	7.50 to 7.75
Railroad malleable	8.50 to 8.75
Agricultural malleable	7.75 to 8.00
Pipes and flues	6.25 to 6.75

Boston

BOSTON, MASS., June 22, 1915.

Old Material.—The market has strengthened to some extent, following the improvement noted last week. The change, however, is a gradual one. Some of the local foundries are very busy, others are comparatively dull, all depending upon their connections with the machine shops. The quotations given below are based on prices offered by the large dealers to the producers and to the small dealers and collectors, per gross ton, carload lots, f.o.b. Boston and other New England points which take Boston rates to Pennsylvania points. Mill prices are approximately 50c. per ton higher.

Heavy melting steel	$8.25 to $8.50
Low phosphorus steel	13.75 to 14.75
Old steel axles	12.75 to 13.25
Old iron axles	20.25 to 20.75
Mixed shafting	12.00 to 12.25
No. 1 steel wrought and soft steel	8.25 to 8.75
Skeleton (bundled)	5.50 to 5.75
Wrought-iron pipe	7.00 to 7.50
Cotton ties (bundled)	5.25 to 5.75
No. 2 light	3.25 to 3.75
Wrought turnings	5.00 to 5.50
Cast borings	5.00 to 5.25
Malleable	7.50 to 7.75
Stove plate	7.00 to 7.50
Grate bars	5.25 to 5.50
No. 1 machinery cast (price to consumer f.o.b. Boston)	13.00 to 13.50
No. 2 machinery cast (price to consumer f.o.b. Boston)	11.50 to 12.00

Philadelphia

PHILADELPHIA, PA., June 22, 1915.

Evidence of betterment is unmistakable in all directions. It must be admitted, however, that the best reports come from those firms which have war business or are getting benefit from its diffusion. The pig-iron trade has not picked up to any marked extent. Structural materials are quiet, and some makers of plates are not so busy as others. Some mills have advanced their quotations on plates, shapes and bars to 1.409c., Philadelphia, prompt delivery, while others have not done so, although an Eastern structural mill announces that its price will be on the basis mentioned after July 1. In general, the market, while improved, may still be called somewhat spotty. The up-lifting features are the excellent demand coming from the shipyards and the builders of locomotives, the request for shrapnel-steel and open-hearth billets for both home and foreign consumption. In some quarters open-hearth billets cannot be had at all. The demand for sheets is more active, because of the high prices of galvanized sheets, and genuine iron sheets are suggested as a substitute. Pig iron has at least held up and the trade is hopeful. Old material shows an upward tendency and coke is firmer.

Iron Ore.—Importations at this port in the week ended June 19 consisted of 5600 tons from Cuba and 7514 tons from Sweden. New business in Transatlantic ore is at a standstill, as it has been for some time. Contracts made at this time would mean a cost of 8½c. to 9c. per unit at tidewater.

Pig Iron.—The trade is imbued with renewed hopefulness, although there has not been any substantial increase in sales. There is some talk of higher prices for foundry grades, but at the same time business is being sought at the present range of quotations. Steel-making irons are unquestionably stronger. At least two furnace representatives are asking $14 for basic, but nothing has been done at this figure. Standard low phosphorus is firmly held at $21 and quotations at $20.50 are declared to have been eliminated. Two eastern Pennsylvania steel companies continue to feel the market for basic, and action will probably be taken this week. Only a few hundred tons of standard low phosphorus has been sold for domestic delivery, but Canadian shipments are keeping up to an extent which makes the difference between a dull market and a fair one. In foundry irons the week showed no decline, but not much gain. The Baldwin Locomotive Works has issued an inquiry for 1000 to 1500 tons of cylinder iron, running 1.15 to 1.50 per cent. silicon, and 500 to 1000 tons of floor grade, running 2.50 to 3.25 per cent. silicon, delivery to be made in the next three or four months. Virginia irons are a little more active. Quotations for standard brands for early delivery in buyers' yards in this district are as follows:

Eastern Penna. No. 2 X, foundry	$14.25 to $14.50
Eastern Penna. No. 2 plain	14.00 to 14.25
Virginia, No. 2 X, foundry	15.25 to 15.75
Virginia No. 2 plain	15.00 to 15.25
Gray forge	13.25 to 13.50
Basic	13.75
Standard low phosphorus	21.00

Ferroalloys.—Representatives of English producers continue to quote $100, forward delivery, for 80 per

cent. ferromanganese, but are not anxious to sell, inasmuch as they have little to spare from their contract commitments. An Eastern mill which has one furnace running on Brazilian ore will give limited deliveries of prompt at $115. No arrivals from England were reported last week. The quotations for 50 per cent. ferrosilicon range from $71 to $73, Pittsburgh, according to quantity.

Bars.—Quotations on steel bars have been advanced on prompt deliveries to 1.25c., Pittsburgh, or 1.409c. Philadelphia, but the action is not unanimous. Those who have made the advance are now asking 1.459c. for third quarter. At 1.409c. a good number of contracts were booked prior to the advance. Specifications continue good. The demand for shrapnel rounds is active, one inquiry calling for 12,000 tons for Canada. The larger makers of iron bars are now asking 1.15c. at mill, or 1.22½c., Philadelphia, for carload lots, and 1.30½c. for less than carloads. A leading mill is operating double turn.

Plates.—Demand from locomotive works and shipyards, plus the miscellaneous demand, has given a decided stimulus to the plate business, and one mill reports that it is operating 90 per cent. It would be working at maximum capacity were it not that the demand for universal plates is somewhat backward. In the past few days orders for 400 locomotives have been placed, all for export, and the builders have in cases asked for quick deliveries on plates and parts. Inquiry for as many more locomotives is pending. The Munson Line has ordered two freight steamers of 7000 tons each from the Maryland Steel Company. An attractive tonnage of plates is also involved in a Government ship which is to be built at the Mare Island Navy Yard. Some plate-makers say they are getting, without difficulty, 1.359c., Philadelphia, for prompt delivery, but others are willing and anxious to get business at 1.309c., Philadelphia.

Rails.—The Southern Railway placed its order for about 6000 tons of rails with the Pennsylvania Steel Company. In miscellaneous track supplies a good business has been done by some companies. The Baltimore & Ohio is in the market for 20,000 kegs of spikes for the last half, and the Lehigh & New England is inquiring for 2000 kegs.

Structural Material.—The market as a whole continues quiet, but in prices a stronger tendency is shown. Some of the mills have advanced their price to 1.409c., Philadelphia, for prompt delivery and would not take business at a lower price. One sales manager says that his instructions are to raise the quotation to the 1.409c. level on July 1. Contracts for the third quarter are still being made, however, at 1.359c., Philadelphia. There continues to be a dearth of large propositions. Bids have been asked on about 500 tons required for the First National Bank Building, Scranton, Pa. The Lehigh Valley Coal Company has asked for bids on a coal breaker. The Philadelphia Life Insurance Company's building, this city, will require about 180 tons of shapes. The Navy Department has asked for bids on 1000 tons of shapes required for a boat to be built at Mare Island. An addition to the Bulletin Building, this city, will require 800 to 1000 tons.

Sheets.—The demand is more active, which is due, in part, to the higher quotations for galvanized sheets. Makers of black and blue annealed sheets are being approached by consumers with whom they never before had dealings. No. 10 blue annealed is unchanged at 1.459c. to 1.509c., Philadelphia.

Billets.—The demand from both export and domestic sources for open-hearth billets is strong. Some mills on which the war demand has been heavy have none but Bessemer billets to offer, and the latter are not acceptable, as a low phosphorus steel is wanted. The quotation is unchanged at $22.02, Philadelphia.

Coke.—In foundry coke there is a steady movement, tending to become more active. In closing for second-half furnace coke, hesitation is shown by the producers, and quotations are declared to be stiff. The scarcity of labor in the coke fields is said to be more than ever a menacing factor, as some of the companies are now taking men from the others. Quotations for prompt delivery furnace coke range from $1.55 to $1.60 per net ton at oven. Second-half furnace is quoted at $1.75. Prompt foundry is quoted at $2 to $2.40 and contract at $2.20 to $2.50. Freight rates from the principal producing districts are as follows: Connellsville, $2.05; Latrobe, $1.85, and Mountain, $1.65.

Old Material.—The market is stronger and dealers are not overwilling to sell at existing prices. Sales of heavy melting steel have been made at $11.50. The quotations on a few other items in the scrap list have strengthened also. Quotations for delivery in buyers' yards in this district, covering eastern Pennsylvania and taking freight rates from 35c. to $1.35 per gross ton, are as follows:

No. 1 heavy melting steel	$11.25 to $11.50
Old steel rails, rerolling	11.50 to 12.00
Low phos. heavy melting steel scrap	14.75 to 15.25
Old steel axles	14.00 to 14.50
Old iron axles	17.50 to 18.00
Old iron rails	15.00 to 15.50
Old carwheels	11.50 to 12.00
No. 1 railroad wrought	13.00 to 13.25
Wrought-iron pipe	10.75 to 11.00
No. 1 forge fire	8.50 to 9.00
Bundled sheets	9.00 to 9.50
No. 2 busheling	7.75 to 8.25
Machine shop turnings	8.50 to 8.75
Cast borings	8.25 to 8.50
No. 1 cast	12.25 to 12.50
Grate bars, railroad	9.00 to 9.25
Stove plate	9.00 to 9.50
Railroad malleable	9.50 to 10.00

Buffalo

BUFFALO, N. Y., June 22, 1915

Pig Iron.—The outlook is brighter. Inquiries are increasing in volume, aggregating about 25,000 tons for the week, chiefly for foundry grades, but including some malleable. The inquiry for malleable mentioned last week has developed into orders for about 3000 tons and additional inquiry from the same sources is coming to producers. The total of sales last week was comparatively small, but shipments on contracts continue to be very heavy. Prices are rather more strongly held by sellers but show no quotable change, being as follows, f.o.b. Buffalo, for last half delivery:

No. 1 foundry	$13.00 to $13.25
No. 2 X foundry	12.75 to 13.25
No. 2 plain	12.75 to 13.00
No. 3 foundry	12.50 to 12.75
Gray forge	12.50
Malleable	12.75 to 13.25
Basic	13.25 to 13.75
Charcoal, regular grades and analysis	15.75 to 17.25
Charcoal, special grades and analysis	19.00 to 20.00

Finished Iron and Steel.—The market shows decided improvement, the demand in structural lines being particularly noticeable. Many new contracts are being made by users and jobbers to take the place of contracts expiring July 1, some buyers covering for larger tonnages than on preceding contracts. A number of steel mills agencies are making an effort to prevent speculative buying and are limiting tonnage contracted for to actual requirements of customers as based on past records. One local interest reports that it has booked a larger tonnage the past week than in any like period since the depression began, and now has sufficient orders on hand to keep its mills operating to a good percentage of capacity (at least 70 or 80 per cent.) over the remainder of the year. Increased inquiry is reported for bolts and nuts and for railroad track supplies. Bids are being received by the board of water and light commissioners, Leroy, N. Y., for 1000 tons of 14-in. cast-iron pipe. Galvanized wrought pipe has been advanced $12 per ton. Galvanized sheets are exceedingly scarce, users being obliged to substitute black sheets of heavier gauge wherever possible. Bids are being received for 300 tons of reinforcing bars for an addition to the plant of the Pierce-Arrow Motor Car Company, this city, and the Jacob Dold Packing Company, Buffalo, will build a plant addition requiring about 200 tons of reinforcing bars. Bids were opened this week for about 350 tons of structural steel for the Gurney Ball Bearing Company's factory, Jamestown, N. Y.

Old Material.—The market has been active in nearly all lines, interest in heavy melting steel and malleable scrap predominating. Increasing demand has been

noted in railroad malleable for the past few weeks and several fairly large sales were made the past week. Shipments on contracts are going forward to consumers freely. Turnings, borings, bundled sheet scrap and busheling scrap have been the most active commodities. Prices remain unchanged from last week. We quote dealers' asking prices per gross ton, f.o.b. Buffalo, as follows:

Heavy melting steel	$10.75 to $11.00
Low phosphorus steel	13.00 to 13.50
No. 1 railroad wrought scrap	10.50 to 11.00
No. 1 railroad and machinery cast	11.00 to 11.50
Old steel axles	12.00 to 12.50
Old iron axles	16.00 to 16.50
Old carwheels	11.50 to 12.00
Railroad malleable	10.50 to 11.00
Machine shop turnings	5.75 to 6.25
Heavy axle turnings	8.50 to 9.00
Clean cast borings	6.75 to 7.00
Old iron rails	11.00 to 11.50
Locomotive grate bars	9.00 to 9.50
Stove plate (net ton)	8.25 to 8.75
Wrought pipe	7.00 to 7.50
Bundled sheet scrap	7.25 to 7.75
No. 1 busheling scrap	8.50 to 9.00
No. 2 busheling scrap	6.50 to 7.00
Bundled tin scrap	9.00

Cincinnati

CINCINNATI, OHIO, June 23, 1915.—(*By Wire.*)

Pig Iron.—The quiet condition prevailing for the past four weeks still exists. Few general inquiries have been issued, chief among which is included one for 1000 tons of coke malleable iron for a Michigan melter. Approximately 500 tons of Lake Superior charcoal will also probably be contracted for this week by a melter in the same territory. A southern Ohio consumer bought 500 tons of No. 4 Southern foundry for last half shipment. Other contracts booked are of a minor nature, and most pig-iron salesmen are now devoting their time to getting foundry-coke contracts. Local selling agencies report the receipt of a number of offers for small tonnages of iron, but practically all of them are too far below the market price to be worthy of consideration. The melt of iron in this territory is evidently improving, as shipments on contracts are going forward at a more satisfactory rate. In a few instances consumers are taking iron faster than is due them. The absence of new business makes it hard to state at what price Southern iron could be bought for strictly last half delivery, but for prompt shipment $9.50, Birmingham basis, has been quoted by several firms. Northern foundry, malleable and basic are all quoted at $12.50, Ironton, for either prompt or last half shipment. Rumors that Northern No. 2 foundry has been shaded for prompt movement appear to be without foundation. Based on freight rates of $2.90 from Birmingham and $1.26 from Ironton, we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 f'dry and 1 soft	$12.90 to $13.40
Southern coke, No. 2 f'dry and 2 soft	12.40 to 12.90
Southern coke, No. 3 foundry	11.90 to 12.40
Southern No. 4 foundry	11.40 to 11.90
Southern gray forge	10.90 to 11.40
Ohio silvery, 8 per cent. silicon	16.01 to 16.26
Southern Ohio coke, No. 1	14.76 to 15.26
Southern Ohio coke, No. 2	13.76 to 14.26
Southern Ohio coke, No. 3	13.51 to 13.76
Southern Ohio malleable Bessemer	13.76 to 14.01
Basic, Northern	13.76 to 14.01
Lake Superior charcoal	16.20 to 17.20
Standard Southern carwheel	26.90 to 27.40

(*By Mail*)

Coke.—Sales agencies are interested mostly in obtaining contracts for foundry coke, as there is no demand here for furnace coke. Quite a number of sales for future delivery were made last week. Foundry coke is unchanged around $2.40 for Connellsville, per net ton at oven, on contract business, but for prompt shipment as low as $2.15 can be done on a few standard brands. Wise County quotations are approximately 10c. above the figures named.

Finished Material.—The galvanized sheet proposition is perplexing. The mills in this vicinity are quoting from 5.50c. to 6c., Pittsburgh basis, for No. 28, but jobbers' quotations are lower. Some business is being done, but it is mainly for nearby shipment. The campaign for the substitution of heavier black sheets for galvanized has evidently produced some results, as orders for the former are said to be on the increase. The latest quotations on steel hoops and bands are 1.35c. and 1.25c., respectively, Pittsburgh. Business in bands is on the mend. Hardware jobbers report the wire nail trade as behind the usual volume at this season. With the exception of a lot of bridge material that will be bought soon by the city of Cincinnati for a steel bridge in Eden Park, no structural shapes are in demand in this immediate vicinity. The local warehouse price on steel bars is unchanged at 1.75c., with the usual extras added for twisted reinforcing concrete bars.

Old Material.—Sales are limited to urgent needs of melters. A few contracts have been made with rolling mills, covering fair sized tonnages, but the foundries continue buying only from hand to mouth. The minimum figures given below represent what buyers are willing to pay for delivery in their yards, southern Ohio and Cincinnati, and the maximum quotations are dealers' prices, f.o.b. at yards:

Per Gross Ton

Bundled sheet scrap	$6.25 to $6.75
Old iron rails	10.50 to 11.50
Relaying rails, 50 lb. and up	19.25 to 19.75
Rerolling steel rails	9.75 to 10.25
Melting steel rails	8.50 to 9.00
Heavy melting steel scrap	8.50 to 9.00

Per Net Ton

No. 1 railroad wrought	$8.50 to $9.00
Cast borings	4.50 to 5.00
Steel turnings	4.50 to 5.00
Railroad cast scrap	9.00 to 9.50
No. 1 machinery cast scrap	10.25 to 10.75
Burnt scrap	6.50 to 7.00
Old iron axles	13.50 to 14.00
Locomotive tires (smooth inside)	8.50 to 9.00
Pipes and flues	5.75 to 6.25
Malleable and steel scrap	7.00 to 7.50
Railroad tank and sheet scrap	5.00 to 5.50

Crocker Brothers, pig-iron and coke merchants, have completed fitting up their new offices in Cincinnati, Ohio, located in suite 1520 First National Bank Building. The offices of the firm, of which H. F. Topp is local sales manager, were recently removed from room 1006 in the same building.

Cleveland

CLEVELAND, OHIO, June 22, 1915.

Iron Ore.—Improved conditions in the iron and steel market are reflected in the ore situation. While sales are still light quite a few blast furnaces are now figuring on their requirements. These include some consumers that at the beginning of the season bought small lots of ore for mixture to last them only through the summer. Lake shipment shows some improvement. We quote prices as follows, delivered at lower Lake ports: Old range Bessemer, $3.75; Mesaba Bessemer, $3.45; old range non-Bessemer, $3; Mesaba non-Bessemer, $2.80.

Pig Iron.—Some of the small consumers would like to purchase foundry iron for the first half of next year at present prices and have been sounding the market with inquiries, but it is doubtful if any producer will sell that far ahead. Generally consumers of foundry iron will take about all the iron they have under contract for the first half delivery, the only exception being the stove manufacturers, some of whom, because of the unsatisfactory condition of the stove industry, will have enough first half iron left over to last them several months. The market continues dull with no sales reported except in small lots and little new inquiry is pending. The only exception is in low-phosphorus iron; the demand for it has improved considerably. A number of inquiries for small lots of this grade for the last half are now pending. Prices on foundry grades are steady at $12.50 Valley furnace for No. 2, and the same quotation in Cleveland for outside shipment. Southern iron is inactive at $9.50 to $10, Birmingham, for No. 2. Some iron can be had at the former price for the third quarter. Most of the local jobbing foundries have about all the work they can do, but some of the foundries throughout the State are reported to be not so favorably situated. We quote, delivered Cleveland, as follows:

Bessemer	$14.65
Basic	13.55
Northern No. 2 foundry	$13.00 to 13.50
Southern No. 2 foundry	13.50 to 14.00
Gray forge	12.75
Jackson Co. silvery 8 per cent. silicon	16.37 to 16.62
Standard low phos. at furnace	19.75 to 20.00

Coke.—Foundry coke is still quite active, considerable business in contracts for delivery during six months or a year being placed the past week. Prices are firm at $2.25 to $2.50 per net ton at oven for the best makes for spot shipment and contract. Furnace coke is quiet with the quotations unchanged at $1.55 to $1.60 for spot shipment and $1.75 for the last half.

Finished Iron and Steel.—The optimistic sentiment that has existed in the steel trade is decidedly more pronounced. Specifications on 1.15c. contracts for steel bars and structural material that expire July 1 are heavy and a large volume of business is being booked in contracts mostly for the fourth quarter, although some extend through the last half. Several mills are refusing to accept specifications on old contracts unless shipments are to be made before July 1. Small current orders are coming out in better volume. Prices are firm and mills, with one exception, are on a 1.25c., Pittsburgh, basis for steel bars and structural material for current orders. Some steel-bar contracts were closed during the week at 1.25c. for the last half, but the tendency is toward 1.30c. for the fourth quarter, and some tonnage has been booked at this price. Plates are quoted at 1.15c. to 1.20c., and some business has been taken at the latter price for the last half delivery. The Donovan Wire & Iron Company, Toledo, has taken 2500 tons of structural steel for a seven-story office building for the Overland Company, Toledo, and T. H. Brooks & Co., Cleveland, has taken 400 tons for a factory building for the Westinghouse Electric & Mfg. Company in Cleveland. Ohio fabricators are figuring on 10,000 tons for the Polk street freight station in Chicago. The demand for sheets is more active, but prices are somewhat irregular on black and blue annealed sheets, sales of the latter being made at considerably lower than regular quotations. We quote black sheets at 1.70c. to 1.80c. at mill for No. 28, some third-quarter contracts being placed at the latter price. Galvanized sheets are quoted at 5c. to 5.50c. and higher for No. 28, and blue annealed at 1.30c. to 1.35c. The railroad demand shows an improvement. The Lake Shore Railroad has an inquiry out for 3000 tons of plates, 750 tons structural material, and 250 tons of steel bars for its last half requirements, and several inquiries are pending for spikes. We note one sale of 500 kegs at $1.40. The demand for bar iron is not active. One round lot sale is reported in the Ohio territory at 1.18½c., Chicago. We quote iron bars at 1.15c., Pittsburgh. The demand for forging billets is more active and some business is being placed at $25, Pittsburgh, for spot shipment and for third quarter. Warehouse prices are 1.80c. for steel bars and 1.90c. for plates and structural material.

Bolts, Nuts and Rivets.—There is a large volume of inquiry for last half bolt and nut contracts from the railroads, the New York Central and about a dozen other roads being in the market for their requirements. Jobbers are also placing contracts for this delivery. Specifications are very good and prices are being well maintained. Some third quarter rivet contracts are being placed at the new prices of 1.50c., Pittsburgh, for structural and 1.60c. for boiler rivets. Bolt and nut discounts are as follows: Common carriage bolts ⅝ x 6 in., smaller or shorter, rolled thread, 80 and 10 per cent.; cut thread, 80 and 5 per cent.; larger or longer, 75 and 15 per cent.; machine bolts with h. p. nuts, ⅝ x 4 in., smaller or shorter, rolled thread, 80 and 15 per cent.; cut thread, 80 and 10 per cent.; larger or longer, 80 per cent.; coach and lag screws, 85 per cent.; square h. p. nuts, blank or tapped, $6.40 off; hexagon h. p. nuts, blank or tapped, $7.30 off; c.p.c. and t. square nuts, blank or tapped, $6.10 off; hexagon ⅝ in. and larger, $7.60 off; 9/16 and smaller, $8.30 off; semi-finished hexagon nuts, ⅝ in. and larger, 85, 10, 10 and 5 per cent.; 9/16 and smaller, 85, 10, 10, 10 and 5 per cent.

Old Material.—There is little inquiry from mills, and dealers are not expecting much activity before August. There is a large surplus of scrap and consumers both here and in the Valley district continue to hold up shipments. Under the circumstances dealers are not eager to take on additional orders which in most cases, would mean extended future deliveries. The supply of borings and turnings is still very large and these grades are a drug on the market. We note the sale of 500 tons of carwheels to a local dealer at $9.40. Stove plate is 25c. a ton higher. Other prices are unchanged. We quote f.o.b. Cleveland as follows:

Per Gross Ton

Old steel rails, rerolling	$11.00 to $11.75
Old iron rails	12.00
Steel car axles	12.00 to 12.50
Heavy melting steel	10.50 to 11.00
Old carwheels	9.75 to 10.00
Relaying rails, 50 lb. and over	22.50
Agricultural malleable	8.00 to 8.50
Railroad malleable	10.00 to 10.25
Steel axle turnings	8.75 to 9.00
Light bundled sheet scrap	8.00 to 8.50

Per Net Ton

Iron car axles	$14.50 to $15.00
Cast borings	6.00 to 6.25
Iron and steel turnings and drillings	5.50 to 5.75
No. 1 busheling	8.50 to 8.75
No. 1 railroad wrought	9.25 to 9.50
No. 1 cast	9.75 to 10.25
Stove plate	8.00 to 8.25

Birmingham

BIRMINGHAM, ALA., June 21, 1915.

Pig Iron.—The leading interest and two others claim to have no pig iron to offer under $10. One of these reports sales of 200 tons the past week; another, none, and the third nominal bookings. One of these is operating three stacks, has reduced accumulations over 30,000 tons since January 1, is still shipping more than its make, and is so well fixed that it still claims to be practically out of the market. The furnace operator reported as selling No. 2 under the market admits that he sells what is nominally known as No. 2, but is only 1.75 per cent. in silicon, as a grade between Nos. 2 and 3, realizing 25c. per ton more than others, who jump straight from No. 2 to No. 3 and secure only No. 3 prices for this intermediate analysis. The trade generally believes that the metal sold under market prices has been of this character. One large interest, an exception to the prevailing inactivity, has sold something like 40,000 tons very recently. One lot of 5000 tons for last half brought $10 and a lot of No. 3 brought $9.50. Spot iron can still be had at $9.75, but the tendency appears to harden to $10 all around. There seems no reason to apprehend curtailment of operations in the steel mills. The present schedule provides for rather more billets than rails. The Gulf States Steel Company reports a let-up in the demand for wire and wire fencing for agricultural purposes, but it is turning out its usual billet production, of which English consumers take a regular supply. We quote for spot and last half delivery, per gross ton, f.o.b. Birmingham district furnaces, as follows:

No. 1 foundry and soft	$10.25 to $10.50
No. 2 foundry and soft	9.75 to 10.00
No. 3 foundry	9.25 to 9.50
No. 4 foundry	9.00 to 9.25
Gray forge	8.75 to 9.00
Basic	9.75 to 10.00
Charcoal	21.00 to 21.25

Cast-Iron Pipe.—Outside of a movement for export, the water-pipe manufacturers report no new business of large dimensions. Operations continue at about 75 per cent. of capacity and there are no accumulations. Prices remain firm and quotations correspond to actual contracts. The sanitary pipe business is not featured by forward delivery orders and is spotted. We quote, per net ton, f.o.b. pipe shop yards, as follows: 4-in., $20; 6-in. and upward, $18, with $1 added for gas pipe.

Coal and Coke.—The Tennessee Company has secured a renewal contract for 150,000 tons of coal for the Nashville, Chattanooga & St. Louis Railroad. Other large contracts have also been let, and Alabama operators secured their usual quota. Some high grade coal is going to the Far West, and there is a good demand for blacksmithing coal. Efforts are being made to ship 75,000 to 100,000 tons to Italy, and it will be done if vessels can be secured. The demand for coke has shown signs of betterment, especially for shipment to Western points. Prices remain about the same. We quote, per net ton, f.o.b. oven, as follows: Furnace, $2.50 to $2.75; foundry, $3 to $3.25; by-product, $2.25 to $2.50, with some grades higher.

Old Material.—The scrap market is uneventful and dealers have reconciled themselves to a quiet period. We quote, per gross ton, f.o.b. dealers' yards, as follows:

Old iron axles	$13.00 to $13.50
Old steel axles	12.50 to 13.00
Old iron rails	12.50 to 13.00
No. 1 railroad wrought	8.50 to 9.00
No. 2 railroad wrought	7.50 to 8.00
No. 1 country wrought	8.00 to 8.50
No. 1 machinery cast	8.25 to 8.50
No. 1 steel scrap	8.00 to 8.25
Tram carwheels	8.25 to 8.50
Stove plate	7.00 to 7.50

St. Louis

ST. LOUIS, MO., June 21, 1915.

Pig Iron.—Some increase is noted in both actual sales and inquiries. The sales continue in small lots, ranging from 400 tons down to carloads, but there have been more of them. Inquiries pending are small, save one for 5000 tons of basic.

Coke.—Business has been somewhat active in renewals of contracts expiring June 30 at about last year's quantities. There has also been some activity in by-product coke, as a result of efforts to tie up consumers in the territory against the competition of the new by-product plant now in operation. The latter is reported as having closed for about 25,000 tons for delivery over the year to one concern, with some smaller lots to others. By-product coke is quoted openly on the Connellsville basis, but there are unsupported reports of sharp cutting as a result of the new competition, and these are likely to be more or less true under the existing conditions.

Finished Iron and Steel.—There has been an increase in the number of orders, though not in individual quantities. Fabricators are in a more encouraged frame of mind and talk optimistically as to new business. Tank plates are somewhat weaker than the rest of the market here. Prices are firm and fabricators are being warned against possibilities of delays. Light rails are apparently not wanted by either the lumber or the coal interests. Movement out of warehouse continues good, with consumers freely paying the retail price. We quote for material out of warehouse: Soft steel bars, 1.70c.; iron bars, 1.65c.; tank plates, 1.80c.; structural material, 1.80c.; No. 10 blue annealed sheets, 2c.; No. 28 black sheets, cold rolled, one pass, 2.55c.; No. 28 galvanized sheets, 4.85c.

Old Material.—While the tone is better, there has been no development of actual business to back it up. The quantity of scrap available is likely to hold prices down until an active demand develops, causing a real movement of material. Only one list came out, the Burlington, for 3000 tons. Relaying rails are firm and inquiries are increasing. We quote dealers' prices, f.o.b. St. Louis, as follows:

Per Gross Ton	
Old iron rails	$10.00 to $10.50
Old steel rails, rerolling	9.50 to 10.00
Old steel rails, less than 3 ft	10.25 to 10.75
Relaying rails, standard section, subject to inspection	22.00 to 23.00
Old carwheels	8.75 to 9.25
No. 1 railroad heavy melting steel scrap	8.75 to 9.25
Shoveling steel	7.75 to 8.00
Frogs, switches and guards cut apart	8.75 to 9.25
Bundled sheet scrap	5.50 to 6.00

Per Net Ton	
Iron angle bars	$10.00 to $10.25
Steel angle bars	7.75 to 8.25
Iron car axles	13.50 to 14.00
Steel car axles	9.50 to 10.00
Wrought arch bars and transoms	10.75 to 11.25
No. 1 railroad wrought	7.50 to 8.00
No. 2 railroad wrought	7.50 to 8.00
Railroad springs	7.75 to 8.25
Steel couplers and knuckles	7.75 to 8.25
Locomotive tires 42 in. and over smooth inside	8.50 to 9.00
No. 1 dealers' forge	6.75 to 7.25
Mixed borings	4.50 to 5.00
No. 1 busheling	7.00 to 7.25
No. 1 boilers, cut to sheets and rings	5.75 to 6.25
No. 1 railroad cast scrap	7.75 to 8.25
Stove plate and light cast scrap	6.25 to 6.75
Railroad malleable	5.75 to 6.25
Agricultural malleable	5.25 to 5.75
Pipes and flues	5.75 to 6.25
Railroad sheet and tank scrap	5.75 to 6.25
Railroad grate bars	6.25 to 6.50
Machine shop turnings	4.75 to 5.25

San Francisco

SAN FRANCISCO, CAL., June 5, 1915.

The absence of normal seasonable purchases for railroad extension, power development, or expansion in several leading industries is severely felt. Notwithstanding a moderate activity in agricultural districts, distributive trade for the past month has been, according to some estimates, less than 70 per cent. of what it should be at this season.

Bars.—A fairly large tonnage is going to implement interests, mines, etc., but other important buyers are practically out of the market. Deformed bars for concrete work are in rather more demand, but by no means active. Carload lots to jobbers, from local mill or warehouse, are held at about 1.70c.

Structural Material.—New inquiries involving a fair tonnage are appearing, but are not of a nature that promises much for the future. Among them are numerous small bridges. Tentative figures are being taken on a theater in Oakland, about 2000 tons, and plans are under way for a 10-story building in the same city. Preliminary work is being started on the Alameda County Infirmary, and some additional business is expected for the University of California. A large market building is also projected for San Francisco. Among contracts recently let were about 500 tons for a juvenile detention home, this city, and a small job for the Paraffine Paint Company, both taken by Dyer Brothers.

Plates.—Development work of the kind that has taken a large tonnage for the last few years is greatly curtailed, and there is no animation to distributive trade among the smaller shops. The prospect of more shipbuilding activity offers some encouragement.

Sheets.—Local jobbing prices on galvanized sheets are still made on a basis of 4.25c., Pittsburgh, as there are fair stocks purchased at or below that price. The advance is materially curtailing the consuming demand, and little new business is coming out. Blue annealed sheets are moving only in a limited way.

Wrought Pipe.—The sharp advance in galvanized pipe has had little effect on local conditions, as plumbing supply houses are fairly well stocked and find sales much below expectations. Moreover, with expectations of a decline in rail freight rates before long, the present disposition is to buy as little as possible.

Cast-Iron Pipe.—Small inquiries, both from municipalities and corporations, are fairly numerous. Los Angeles is in the market for about 1200 tons, and Pasadena for a small tonnage.

Pig Iron.—The market shows little change. For nearly a year local requirements have been considerably below normal, and while recent arrivals of foreign iron have been light there is still an ample supply of most varieties on hand. Spot values continue uncertain, being largely a matter of private deals. No. 1 Southern foundry iron is being used to a limited extent, selling at about $20.50 per gross ton, San Francisco.

Coke.—The tonnage of domestic coke used in this vicinity shows a tendency to increase, prices being those ruling at producing points plus rail freight. Foundry requirements, however, are not large, and there is still a fair tonnage of foreign coke here. Good foundry coke in local yards is held at $14 per net ton. A good sized shipment of coke left recently for Honolulu.

Old Material.—Steel melting scrap is very irregular in value, occasional lots being picked up at extremely low prices, while many holders are steadily refusing to accept the present offers of about $6 to $7 per gross ton, made by some of the larger melters. The demand is by no means urgent. Sales of cast-iron scrap are about up to the recent average, with prices at the old range of $14 to $15 per net ton. A shipment of 200 tons of old horseshoes was recently made to China.

The Rosedale Foundry & Machine Company, North Side, Pittsburgh, has received an order from the United States Government for two needle valve outlets for the Roosevelt reservoir, Salt River project, Arizona, the total price being $6,240.

New York

NEW YORK, June 23, 1915.

Pig Iron.—A number of foundries are asking for shipments at a greater rate than their contracts call for, indicating an increased melt in several departments of the industry, particularly at foundries connected with metal-working plants. The jobbing foundry trade shows little change. In New England an inquiry for 2000 to 3000 tons from a malleable interest is on the verge of being closed, if a portion of it has not already been placed. A New Jersey inquiry for 2000 tons, equally divided between No. 1 foundry and No. 2 plain, is still under consideration. In this district the business of the week includes two sales of 500 tons each. Prices have not changed. Among Pennsylvania furnaces those in the eastern valleys are firmest, and in one or two cases these furnaces are unwilling to sell beyond the third quarter at present prices. Two or three furnaces farther west in Pennsylvania are quoting prices representing concessions, one such furnace having sold at $12.50 at furnace, equivalent to about $14.35 at tidewater. A considerable sale of basic iron has been made to a New Jersey steel works. We quote at tidewater as follows: No. 1 foundry, $14.50 to $14.75; No. 2 X, $14.25 to $14.50; No. 2 plain, $13.75 to $14; Southern iron, $14.50 to $14.75 for No. 1 and $14.25 for No. 2.

Ferroalloys.—It is recognized that general conditions favor an advance in the price of ferromanganese rather than a decrease, though deliveries on old contracts are stated to be generally satisfactory, with consumers pretty well covered for the present. There have been some sales of small lots of British ferromanganese at $100, seaboard, and there are some inquiries before the market, but all transactions are subject to British license to ship. New consignments are on the way from Great Britain to this country. Domestic ferromanganese has been sold by producers and dealers in Pennsylvania at $100 to $115 at furnace, but the amount has not been large. The 50-per cent. ferrosilicon market is reported quite active, with both foreign and domestic sales, the steel foundry interests showing more attention lately. The quotation is still $71 to $73, Pittsburgh.

Structural Material.—There are but two fairly large projects before the market—6400 tons for section 1, route 29, for the Eastern Parkway subway, the low bidder for which is understood to be Newman & Cary, and 6000 tons for the new building for the Department of the Interior at Washington, bids on which are to go in about July 22. The subway contract is not yet allotted and it is therefore not known who will get the steel. The Underpinning & Foundation Company is also reported as low bidder. There are numerous projects of 500 to 3000 tons which have been awaiting decision for some time and there is a distinct absence of inquiries of any size. Architects report that they are busier and the general expectation is for developments from this quarter before long. The Pennsylvania Railroad has awarded to various fabricators about 3000 tons for the 22 bridges it has been intending to buy for some time and now has no further inquiries before the market. It is expected that this road will soon ask for bids through contractors for steel arch centers for the new stone bridge over the Schuylkill River at Manayunk involving anywhere from 500 to 2000 tons. There is a marked dearth of railroad buying. Recent awards comprise 800 tons for a storehouse for the Grand Union Tea Company at Front and Jay streets, Brooklyn, to the American Bridge Company; 400 tons for a building for the Stevens Milk Company, Brooklyn, to the Communipaw Steel Company; 300 tons for the Manchester (N. H.) Traction Company to Levering & Garrigues, and 300 tons for a building for the Loomis Institute of Windsor, Conn., to the Heddon Iron & Construction Company. The American Bridge Company has also taken a contract for an experiment station for the U. S. Bureau of Mines at Pittsburgh, 450 tons. New projects which have recently come up for bids are 1000 to 1500 tons for a hotel and theater building at Charleston, S. C.; 350 tons for a store and loft building at 626 Fifth avenue; 400 tons for a grand stand for the Wequahic Club, Newark, and 200 tons for the Victoria Theater at Forty-second street and Eighth avenue. The Maine Central is asking for bids for a 50-ton bridge. The Mullica River bridge at Atlantic City, 550 tons, is reported to have gone to Lupfer & Remick as general contractors. While officially the quotation has been generally advanced to 1.25c., Pittsburgh, for third quarter there is doubt as to its general maintenance. We quote mill shipments at 1.20c. to 1.25c., Pittsburgh, or 1.369c. to 1.419c., New York, and from store 1.85c. to 1.90c., New York.

Plates.—Domestic inquiry and sales in this locality are reported as distinctly better and prices are inclined to stiffen. Causes contributing to this condition are the recent placing of over 550 locomotives and over 7700 cars with American and Canadian builders besides the Russian orders. In addition to the 450 locomotives for Russia reported last week 104 are said to have been contracted for, 64 of them for France, 20 for Serbia and 6 for Brazil, the balance for domestic railroads. France is reported to have placed orders for 3500 freight cars of the 10 to 20-ton flat and box type characteristic of that country. Of these the Middletown Car Company (Standard Steel Car Company) is said to have taken 2500 cars and the Canadian Car & Foundry Company 1000 cars. The Rock Island has placed its contemplated order for 4000 freight cars, of which the Pullman Company will build 2500 cars, the Bettendorf Axle Company 1000 cars, and the Haskell & Barker Company 500 cars. The Pressed Steel Car Company will furnish 1500 center constructions for the Northern Pacific. Though the official price has been generally announced as advanced to 1.25c., Pittsburgh, for new and third quarter business, no sales are reported at any advance over former quotations. We quote steel plates at 1.20c to 1.25c., Pittsburgh, or 1.369c. to 1.419c., New York, and from store, 1.85c. to 190c., New York.

Iron and Steel Bars.—There has been a general advance to a 1.25c., Pittsburgh, basis for steel bars for third quarter business and even for June delivery. As most consumers are covered for some weeks and many of them for several months, there has not been a fair chance to test the new price, though several inquiries are reported to have brought out nothing better than 1.25c. Export demand and sales continue large and domestic business is fair, with specifications good. Bar-iron makers report sentiment distinctly better, with a disposition by consumers to contract for the third quarter and second half, though actual new orders have not increased greatly. The advance in prices of steel bars is expected to have a similar effect on iron bars, and $1 per ton more is asked for third quarter shipments. We quote mill shipments of steel bars at 1.20c. to 1.25c., Pittsburgh, or 1.369c. to 1.419c., New York, and refined iron bars, 1.20c. to 1.25c., New York. Out of store in New York iron and steel bars are 1.80c. to 1.85c.

Old Material.—A somewhat better movement has taken place in heavy melting steel scrap. Several sales of 1000-ton lots have been made to consumers in eastern Pennsylvania, and prices are slightly higher. A better demand has been felt for cast borings and wrought pipe, on which quotations are also stronger. Brokers report holders indisposed to part with scrap, being apparently confident of getting better prices in the near future. Brokers' quotations to local dealers and producers, per gross ton, New York, are as follows:

Old girder and T rails for melting	$9.00 to $9.25
Heavy melting steel scrap	9.00 to 9.25
Relaying rails	19.00 to 19.50
Rerolling rails (nominal)	9.00 to 9.25
Iron car axles (nominal)	15.25 to 15.75
Steel car axles (nominal)	11.75 to 12.25
No. 1 railroad wrought	10.50 to 10.75
Wrought-iron track scrap	9.50 to 9.75
No. 1 yard wrought, long	9.50 to 9.75
No. 1 yard wrought, short	9.00 to 9.25
Light iron (nominal)	3.25 to 3.75
Cast borings	6.00 to 6.25
Wrought turnings	6.00 to 6.25
Wrought pipe	8.25 to 8.50

Foundrymen have begun to take more interest in the market. Several founders in Jersey City and Newark have bought larger quantities than for some time, and a few large consumers are endeavoring to make

contracts for their requirements for the remainder of the year. Quotations to consumers on cast scrap are as follows, per gross ton, New York:

Old carwheels	$9.25 to $9.50
No. 1 heavy cast, broken up	11.00 to 11.50
Stove plate	8.00 to 8.25
Locomotive grate bars	7.50 to 8.00
Malleable cast (railroad)	7.50 to 8.00

Cast Iron Pipe.—Only small public lettings are now coming out. Oakfield, N. Y., will open bids from contractors June 24 for furnishing and laying 4 miles of 6 to 10 in. Cambridge, Mass., will open bids June 28 on 172 tons of 6's and 8's. Private buying continues in quite good volume. The large quantity of pipe needed for Philadelphia has so far not been purchased by the contractors who received the award for this work some weeks ago. Prices continue firm. Carload lots of 6 in., class B and heavier, are quoted at $22.50 to $23 per net ton, tidewater, class A and gas pipe taking an extra of $1 per ton.

GERMAN MARKET ADVANCES

Some Prices Higher Than in Many Years—Heavy Demand for Pig Iron

BERLIN, GERMANY, May 26, 1915.

The iron market continues in fine shape within the restricted scale of production necessitated by the war. All works are running full so far as laborers are concerned but could increase their output considerably if more workmen could be had. The price tendency has remained very strong and large advances have been made since the last report about three months ago. In the second week of April various kinds of finished goods were marked up by agreement from 10 to 20 marks ($2.38 to $4.76) per ton, and since that time the upward movement has continued. Thus the price agreed upon for soft steel bars was 135 marks ($32.13), but sales are now mostly made at between 140 and 150 marks ($33.32 and $35.70). These are the highest prices in a great many years. Open-hearth steel bars cost 15 to 20 marks ($3.57 to $4.76) more than the prices just quoted. The convention price for heavy plates is 140 to 145 marks ($33.32 to $34.51), but actual selling is somewhat higher. Thin plates range around 170 to 175 marks ($40.40 to $41.65). Similar conditions prevail in the market for finished wire and wire rods. The price of the latter was fixed by agreement at 135 marks ($32.13), but sales now are at 140 to 147.50 marks ($33.32 to $35.10). There is a very big demand for drawn wire, chiefly for military uses, and where prompt delivery is stipulated the highest prices are demanded. Prices for tubing are firmly held, although there is not much new buying.

The trade expects that the upward tendency will continue for some time, notwithstanding the elimination of Italy from the market; it had been buying very actively for some months. The price position is so strong that the loss of that trade can hardly affect the market. Germany's exports of iron and steel and their manufactures (other than machinery) to Italy in 1913 amounted to somewhat more than $7,000,000, and those of machinery of all kinds to about $5,000,000. Later figures are not available.

The demand for pig iron has grown more active. Foundries are calling for enormous quantities for military purposes; not a few of them are taking considerably bigger amounts than in peace times. Because of the large home demand furnaces stopped taking foreign orders last month. The April production reached 939,000 metric tons. The daily rate of production in April was 1017 tons greater than in March.

The Steel Works Union began selling semi-finished products about the beginning of the month at prices about 7 marks ($1.48) higher than its previous level. The demand is quite strong. Work on rails for the rest of the year is expected to be of satisfactory volume.

The ore market is described as extraordinarily firm, owing to the shortage of foreign supplies. Prices for domestic ores have risen. Sparry grades in the Siegerland region cost 142 marks ($33.79) for 10-ton carloads, unroasted; or 215 marks ($51.17) roasted. Brown iron ore is going at 190 marks ($45.22). Luxemburg minettes, containing 31 per cent. iron, command 35 marks ($8.33) a carload at the mine.

British Market Easier

Pig Iron Lower, But Coke Dearer — Growing Demand for Terne Plates

(*By Cable*)

LONDON, ENGLAND, June 23, 1915.

The pig-iron market is weaker on speculative selling and there is a lack of interest by domestic and export buyers. Shipments continue small and selling prices are alleged to be unremunerative largely because of dear coke. Hematite iron is inactive with considerable supplies of Rubio ore available. The furnaces in blast are 166 against 168 a year ago.

Welsh bars are easier because many galvanizers are closed. Black sheets are also easier because of competition for business. Otherwise the tendency of steel prices is firm and upward. American tin-plate wasters (14 x 18¾) have been sold at 19s. ½d. ($4.63), c.i.f. Liverpool. There is a growing demand for terne plates at 34s. 6d. to 35s. ($8.39 to $8.52). Stocks of pig iron in Connal's stores were 153,820 tons at the close of last week against 152,780 tons one week previous. We quote as follows:

Tin plates, coke, 14 x 20, 112 sheets, 108 lb., f.o.b. Wales, 19s. ($4.62).

Cleveland pig-iron warrants, 66s. 4d. ($16.14), against 67s. 7d. ($16.44) last week.

No. 3 Cleveland pig iron, makers' price, f.o.b. Middlesbrough, 66s. 6d. ($16.18), compared with 67s. 9d. ($16.48) one week ago.

Steel black sheets, No. 28, export, f.o.b. Liverpool, £11 10s. ($55.96), against £11 15s. ($57.18) a week ago.

Steel ship plates, Scotch, delivered local yards, £9 15s. ($47.44).

Steel rails, export, f.o.b. works port, £8 7s. 6d. ($40.75).

Hematite pig iron, f.o.b. Tees, 100s. ($24.33).

Sheet bars (Welsh), delivered at works in Swansea Valley, £7 15s. ($37.71).

Steel joists, 15 in., export, f.o.b. Hull or Grimsby, £10 ($48.66).

Steel bars, export, f.o.b. Clyde, £10 15s. ($52.31).

Ferromanganese, f.o.b. £20 15s. ($100.98).

Ferrosilicon, 50 per cent., c.i.f., £14 5s. ($69.35).

Metal Market

NEW YORK, June 23, 1915.

The Week's Prices

Cents Per Pound for Early Delivery

	Copper, New York			Lead		Spelter	
June	Lake	Electrolytic	Tin, New York	New York	St. Louis	New York	St. Louis
16	22.50	20.12½	41.50	7.00	7.00	21.00	20.50
17	22.50	20.00	41.00	6.25	6.00	20.00	19.50
18	22.50	20.00	41.15	6.00	5.65	19.50	19.00
19	22.50	20.00	.....	5.75	5.35	18.50	18.00
21	22.50	20.00	41.50	5.75	5.35	18.25	18.00
22	22.50	20.00	41.25	5.75	5.35	18.00	17.50

Copper is quiet and weaker. Tin is lower and the demand is light. Lead slumped 1¾c. in the week, and with the decline there was no activity. Spelter is dull and has declined steadily. Antimony continues scarce and firm.

New York

Copper.—Most of the larger producers assert that they are holding firmly to 20.50c., 30 days, delivered, for electrolytic, but at least one small producer will sell at concessions. From second-hands there is no question that the metal can be procured at 20.12½c., full terms, or 20c., cash. The week has been quiet, though on some days there has been fair inquiry. It is still pending and may come to an issue any day. Lake is quoted at 22.50c. for prime grades; others are lower. It is certain that further requirements will develop with manufacturers of war materials, even though their immediate needs may be supplied. It is the general opinion that copper is in a better position than the other metals. The exports are light this month, as to date they total but 13,138 tons.

Tin.—The market has undoubtedly been affected by the slump in lead and spelter. On no day has any really large business been done and quotations have eased off until 41.25c. was quoted yesterday. There have been some offers of Banca tin in small lots at low prices, which were quickly taken up. Spot supplies are small, as might be expected in view of the English restrictions on trading, which make the carrying of stocks both difficult and expensive. The arrivals this month total 1975 tons, and there is afloat 5992 tons. The greater part of the metal afloat is Straits tin on unknown steamers.

Lead.—A week ago the New York quotation of the American Smelting & Refining Company was 7c., but by Saturday it had been reduced to 5.75c., where it stood yesterday. It is weak at the latter price, with outside sellers willing to let go at 5.37½c. In the tremendous rush to buy when prices were ascending it is estimated that several thousand tons were taken, but when the downward trend started buying ceased, and since then there has been but little doing. On the upward movement the independents were asking, and getting, more than the largest interest, but after the market broke they did the reverse and sold lower. Not only first and second hands offered the metal, but consumers who had bought heavily were eager to sell. Many of the latter were disappointed and now find themselves with much more lead than their needs require. The market today is demoralized and a further decline is looked for. The exports this month total 5586 tons.

Spelter.—The New York quotation is down to 18c., and even lower has been mentioned. Offerings continue to be made, largely by consumers, with little or no disposition to buy being shown. The decline has been entirely in prime Western, the higher grades of brass mill spelter holding firm at nominal prices. The market is variously regarded and is admittedly a puzzle. Some observers are of the opinion that prices will shoot up again with a renewal of demand. They point to government statistics as a defense of the recent trend of prices. These show that in April the exports of pigs, bars, plates and sheets amounted to 17,683,173 lb., against only 120,149 lb. in the same month last year. In the 10 months ended April, 1915, the exports totaled 222,478,162 lb., against 3,243,418 lb. in the same period of 1914, and 4,997,680 lb. in 1913. The 10 months referred to take in the nine months of the war. On the other hand, the action of England in forbidding the use of spelter by the galvanizers in that country is construed as a weakening influence. The trade is of the opinion that the United States Steel Corporation is making a wise move in building a smelter near Pittsburgh. Since the outbreak of the war a number of small smelting companies have sprung up. Sheet zinc was reduced to 27c., base, f.o.b. mill, yesterday.

Antimony.—June and July deliveries of Chinese and Japanese are quoted at 37c., duty paid, and the market is firm. English brands continue out of the market and unquotable.

Old Metals.—The market is quiet. Dealers' selling prices have been reduced and are now nominally as follows:

	Cents per lb.
Copper, heavy and crucible	18.50 to 19.00
Copper, heavy and wire	18.00 to 18.50
Copper, light and bottoms	15.50 to 16.00
Brass, heavy	13.50 to 14.00
Brass, light	11.50 to 12.00
Heavy machine composition	14.50 to 15.00
No. 1 yellow rod brass turnings	14.00 to 15.00
No. 1 red brass or composition turnings	12.50 to 13.00
Lead, heavy	5.00
Lead, tea	4.75
Zinc, scrap	12.00

Chicago

JUNE 21.—The sudden drop in the price of spelter is the feature of this week's market, which reflects a generally softer tone for all of the metals. We quote: Casting copper, 19.50c.; Lake copper, 20.50c.; tin, carloads, 42.25c.; small lots, 44.25c.; lead, 5.50c. to 6c.; spelter, nominally, 18c.; sheet zinc, 25c.; Cookson's antimony, 50.50c.; other grades, 40c. On old metals we quote buying prices for less than carload lots as follows: Copper wire, crucible shapes, 16c.; copper bottoms, 15c.; copper clips, 15.75c.; red brass, 13c.; yellow brass, 12.75c.; lead pipe, 4.75c.; zinc, 8c.; pewter, No. 1, 23c.; tinfoil, 33c.; block tin pipe, 36c.

St. Louis

JUNE 21.—Some of the excited character of the metal markets has disappeared and prices are being quoted with more assurance of their being maintained at least long enough to book an order. Lead is held today at 6c.; spelter, 22c.; tin, 44c.; Lake copper, 21c.; electrolytic copper, 20½c.; antimony, 42c. In the Joplin ore market the highest price paid for zinc blende, 60 per cent. basis, was $128 per ton, with low grades selling as low as $70. Calamine sold for $55 to $60, basis of 40 per cent., with a top price of about $65. Lead ore sold for $72 to $75, basis of 80 per cent. Miscellaneous scrap metals are quoted as follows: Light brass, 10c.; heavy yellow brass, 11½c.; heavy red brass and light copper, 13¼c.; heavy copper and copper wire, 17c.; pewter, 25c.; tinfoil, 32c.; lead, 4¾c.; zinc, 12c.; tea lead, 3½c.

Iron and Industrial Stocks

NEW YORK, June 23, 1915.

The strength of the stock market not only continues, but has gained further momentum. Industrial stocks have advanced to new high levels for this movement, and in some cases, notably Bethlehem Steel common, fresh high records have been made. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week has been as follows:

Allis-Chal., com.	17¾ - 19¼	Pressed St'l, com.	48½ - 50⅝
Allis-Chal., pref.	51⅝ - 53½	Ry. Steel Spring, com.	32½ - 34⅝
Am. Can, com.	44 - 46⅞	Republic, com.	29⅛ - 30⅝
Am. Can, pref.	102 - 103⅞	Republic, pref.	87 - 88
Am. Car & Fdy., com.	55 - 56½	Rumely Co., com.	5 - 5⅞
Am. Car & Fdy., pref.	113 - 114	Rumely Co., pref.	12⅜ - 15
Am. Loco., com.	50¼ - 54¼	Sloss, com.	35⅜ - 37½
Am. Loco., pref.	96 - 97	Pipe, com.	13⅝ - 14½
Am. Steel Fdries.	35 - 43½	Pipe, pref.	40⅛
Bald. Loco., com.	58¼ - 69¾	U. S. Steel, com.	59⅜ - 61¾
Bald. Loco., pref.	101¾ - 103½	U. S. Steel, pref.	109 - 110
Beth. Steel, com.	160½ - 172¾	West'gh'se Elec.	97⅛ - 100½
Beth. Steel, pref.	116 - 116½	Am. Ship, com.	33 - 41
Colorado Fuel	31⅞ - 33⅝	Am. Ship, pref.	70 - 75
General Elec.	171 - 175⅛	Chic. Pneu. Tool	56¾ - 58
Gt. No. Ore Cert.	35½ - 37½	Cambria Steel	48⅜ - 49¼
Int. Harv. of N. J., com.	102½ - 107½	Lake Sup. Corp.	11¼ - 12½
Lackawanna Stl.	45¼ - 50	Warwick	9½
Nat. En. & St., com.	16 - 17⅞	Cruc. Steel, com.	30 - 31
Pitts. Steel, pref.	80 - 85	Cruc. Steel, pref.	88½ - 90
		Harb.-Walk. Refrac., pref.	98½ - 99
		La Belle Iron, pref.	103

Dividends

The American Locomotive Company, regular quarterly, 1¾ per cent. on the preferred stock, payable July 21.

Manning, Maxwell & Moore, Inc., quarterly 1½ per cent., payable June 30.

The Willys-Overland Company, regular quarterly, 1¾ per cent. on the preferred stock, payable July 1.

The Yale & Towne Mfg. Company, regular quarterly dividend of 1¾ per cent., payable July 1.

The Linde Air Products Company, regular quarterly, 1½ per cent. on the preferred stock, payable July 1, and 2 per cent. on the common stock, payable June 30.

The E. W. Bliss Company, regular quarterly, 1¼ per cent. and an extra dividend of 1¼ per cent. on the common stock, and 2 per cent. on the preferred stock, all payable July 1.

The Youngstown Sheet & Tube Company, regular quarterly, 1¾ per cent. on the preferred and 2 per cent. on the common stock, payable July 1.

The Sharon Steel Hoop Company, regular quarterly, 1¾ per cent. on the preferred stock, payable July 1.

The Brier Hill Steel Company, regular quarterly, 1¾ per cent. on the preferred stock, payable July 1.

The Dodge Mfg. Company, regular quarterly, 1¾ per cent. on the preferred stock, payable July 1.

The Canadian Locomotive Company, Ltd., regular

quarterly, 1¾ per cent. on the preferred stock, payable July 1.

The Canadian Westinghouse Company, Ltd., regular quarterly, 1 per cent., payable July 10.

The Otis Elevator Company, regular quarterly, 1¼ per cent. on the common stock and 1½ per cent. on the preferred stock, both payable July 15.

The Standard Screw Company, regular quarterly, 3 per cent. on the common stock, 3 per cent. on Class A preferred stock and 3½ per cent. on Class B preferred stock, all payable July 1.

The Washburn Wire Company, regular quarterly, 2 per cent. on the common stock and 1¾ per cent. on the preferred stock, both payable July 1.

The Garvin Machine Company, regular semi-annual, 3½ per cent. on the preferred stock, payable July 1.

The Westinghouse Electric & Mfg. Company, regular quarterly, 1¾ per cent. on the preferred stock, payable July 15, and 1 per cent. on the common stock, payable July 30.

The Youngstown Iron & Steel Company, regular quarterly, 1¾ per cent. on the preferred stock, payable July 1.

The Trumbull Steel Company, regular quarterly, 1¾ per cent. on the preferred stock, payable July 1.

The Ohio Iron & Steel Company, 1¾ per cent. on the preferred stock, payable July 1.

The Chicago Pneumatic Tool Company, regular quarterly, 1 per cent., payable July 26.

U. S. Cast Iron Pipe Report

The United States Cast Iron Pipe & Foundry Company has issued its sixteenth annual report, which covers its operations in the year ended May 31, 1915. This report is of a more favorable character than the one for the preceding year. It shows that the business of the company has turned the corner, net earnings of $75,599.13 having been realized, as compared with a loss of $59,867.83 in the preceding year. It is true that the improvement thus shown was not great, but the fact that the company's operations are now reaping a profit is far more satisfactory to the stockholders than if a loss had been recorded. The income account for the year, as compared with the preceding year, is as follows:

	1914-5	1913-4
Total earnings, after deducting cost of maintenance and operation of plants, expenses of sales and general offices and provision for taxes and doubtful accounts	$211,267.46	$121,297.21
Other income, consisting of interest on bonds in treasury and sinking fund and other miscellaneous income	107,804.06	70,334.62
Total	$319,071.52	$191,631.83
Reserved for improvements and replacements	96,000.00	96,000.00
Balance	$223,071.52	$95,631.83
Interest on bonds and bills payable	147,472.39	155,499.66
Net gain for the year	$75,599.13	*$59,867.83

*Loss.

At the close of the year the company, according to its balance sheet, had a large excess of current assets over current liabilities, amounting to $3,283,435.94, besides having a reserve for improvements, insurance, etc., of $424,754.41, and a surplus of $1,953,016.66.

The following extracts are taken from the accompanying remarks of President L. R. Lemoine:

"We believe it is beginning to be appreciated (though not yet crystallized into law) that there is a real interdependence between the general interests of the public and business, and that the welfare of the body-politic is intimately connected with the underlying causes of business depression and prosperity. In the proper solution of these problems the vital issue involved is co-operation between Government and business. Such co-operation is necessary in order that industrial development be not discouraged and crippled, but rather that proper business expansion be encouraged and may again become the order of the day. It would be great cause for congratulation if those in charge of legislation, or the new Federal Trade Commission, should come to regard co-operation as the rightful adjunct of business, not only as to export business but in the domestic field; and if our Government should apply to the business relations of business in this country the same spirit which it is now beginning to suggest with respect to the business relations of our citizens with other countries.

"Comparative operating costs of your plants show a very satisfactory decrease as compared with former costs, so that while the output of your chief product was about 5 per cent. less as compared with a year ago, the cost of manufacture, exclusive of cost of carrying idle plants, shows a reduction of a trifle under 10 per cent. This gain in efficiency represents a saving of over $250,000 on the output of the year; and obtains in spite of the unfavorable conditions under which operations were curtailed during a considerable period at nearly all of your plants. Computing the cost of manufacture on a basis which would include the cost of iron, the reduction this year in cost shows a gain on the output of well over $500,000. This gain, however, was in large measure offset by the lower prices obtained for your product—the average price per ton on your chief product this year being well below the actual cost of manufacture during the year before. In fact, during the past two years there has been a decline in prices per ton received on this product equal to nearly three times the margin which then existed between the cost and sales price, so that were it not for the increasing efficiency in your plants the results for the year would have been very much less favorable. As pointed out a year ago, plant efficiency will not alone create earnings. Prices must be obtained that will show a fair return. Your board is hopeful, however, that the recent slight improvement in prices reflects an unwillingness on the part of the pipe makers generally to hereafter see prices recede to a point which allows of no profit. With a return of confidence, the demand for your product should broaden with the general improvement in business that is sure to come.

"Plans have been adopted for the complete remodeling of your Bessemer plant. The work now under way calls for a considerable outlay and embodies comprehensive and quite extensive alterations to the pipe shop proper. Later attention will be given to the improvement of the jobbing or fittings foundry, machine shop, pattern-storage, yard and other facilities; and it is confidently expected the present expenditure will be speedily returned through lower costs at these works.

"During the year the upkeep of your active plants and their equipment has been maintained. Under improved conditions, bringing a fair return on your output, the more complete modernizing of plants, it is hoped, can be gradually accomplished without increasing your liabilities; and this will be facilitated as you are able to dispose of to advantage the smaller obsolete units which now comprise your idle properties. In all these changes your ability to meet a normal demand for your product will not be lessened, but rather through centralization your tonnage will be distributed from fewer advantageously located works."

New England Iron and Hardware Association

The annual meeting of the New England Iron and Hardware Association was held at Young's Hotel, Boston, Tuesday, June 15, and was largely attended. George M. Gray presided. Reports of committees were presented and showed the association in a prosperous condition. After the dinner, the following were elected officers and directors for the ensuing year: President, Charles A. Adams, Manchester, N. H.; vice-president, Wilbur B. Ayer, Providence, R. I.; treasurer, Charles H. Breck, Boston; clerk, George J. Mulhall, Boston; directors—Charles A. Adams, Wilbur B. Ayer, George M. Gray, R. M. Boutwell, A. B. Marble, Frank A. Marvin, Herbert Field, C. W. Henderson, Fred L. Avery, C. F. Bragg and L. C. Carter.

The retiring president, Mr. Gray, made remarks and was followed by Mr. Adams, who then took the chair. E. P. Sanderson, Boston, gave an interesting talk on his recent trip to California.

Boiler Manufacturers' Convention

Methods of securing the adoption by the various States of the standard boiler code, known as the A. S. M. E. code, and formulated by the American Society of Mechanical Engineers in conjunction with committees of boilermakers and steam users, formed the principal subject of discussion at the convention of the American Boiler Manufacturers' Association at Erie, Pa., June 21 and 22. The convention comprised joint meetings of the American Boiler Manufacturers' Association, the National Tubular Boiler Makers' Association and the Threshermen's Association.

The opening session on Monday was devoted entirely to the question of uniform specifications and the methods which should be pursued to have them adopted by the various States. Two committee reports dealing with this question were presented, one taking up the legal side, while the other was of a historical character, and outlined the work of the committee of the Boiler Manufacturers' Association which co-operated with the code committee of the A. S. M. E.

In presenting this report Thomas Durban, Erie City Iron Works, told of the exacting and arduous labors of the joint committees in harmonizing the conflicting views of different interests, finally producing a code for boiler construction which had secured almost universal approval. Letters were read from various municipal and State authorities, voicing their approval of the code and telling of its adoption or of the steps being taken to insure its adoption. John Price Jackson, head of the Industrial Department of the State of Pennsylvania, wrote that his department had adopted the code and will put it in effect at once through the force of boiler inspectors attached to the department. The city of Chicago has given the code official recognition, as have the city of St. Louis and the State of California. Several State legislatures convene next spring, and steps are being taken to lay the code before them and secure its adoption into their laws. The State of Tennessee has already appointed a committee to formulate a boiler code, and the American Boiler Manufacturers' Association is in touch with it.

An amendment has been offered in the New York State constitutional convention, now in session, which will empower the Legislature to create a bureau or department to take charge of steam boilers and other pressure vessels, and draw up a code for their construction, operation, maintenance and inspection. It seems that in New York the Legislature has not at this time the power to create the mechanism for regulating steam boilers. The inspection of boilers in New York City is in the hands of the police department, and there are no regulations governing the construction and inspection of boilers which are uniform throughout the State. A resolution was offered to memorialize the constitutional convention in favor of the adoption of this amendment, known as amendment No. 500.

Representatives of various societies and State boards were in attendance, and addressed the convention on features of the code. The representative of the National Association of Stationary Engineers spoke of the necessity of publicity, and a great deal of publicity, if sufficient public opinion was to be formed to influence legislatures to adopt the legislation advocated by the convention. He instanced the more or less futile efforts of his association to obtain a uniform engineers' license law as an example showing the inertia of legislators on technical questions. He also stated that his association would, at its next convention, recommend the general adoption of the code. Other speakers dwelt on the value of continued publicity, and finally a committee was appointed to collect funds for this purpose. Several schemes were advanced, including the one at present in use of a uniform monthly assessment on all the members; another suggested scheme was a tax on every boiler horsepower output of the various members, which it was considered would equalize the burden between large and small manufacturers; a third suggestion was a joint council, formed of members or committees from the various interested organizations, similar to the committees which co-operated with the Mechanical Engineers in formulating the code. The committee took these suggestions under advisement, and later reported a resolution providing that a fund of $12,000 be raised by an Administrative Council consisting of one member from the Boilermakers' Association and one from each of the allied interests. The interests specifically named in the resolution were, in addition to the American Boiler Manufacturers' Association, the National Tubular Boilermakers' Association, the boiler insurance interests, the water-tube boiler manufacturers, the National Boiler and Radiator Manufacturers' Association, the locomotive manufacturers, the boiler material manufacturers, the boiler users, the manufacturers of tractors, of steam shovels and dredges, wrecking crane manufacturers, and hoisting engine builders. The resolution was adopted.

The conclusion of the report of this convention's proceedings will appear in next week's issue.

For South American Trade Promotion

Judge E. H. Gary has been appointed by Secretary McAdoo as one of the ten representatives of the United States on the International High Commission which is to continue the work of the recent Pan-American Financial Conference at Washington. President James A. Farrell of the Steel Corporation is chairman of a special committee also appointed by authority of the conference, to consider a visit of business men to South and Central America. The high commission, which will probably meet in Buenos Aires November 1, consists of nine members from the United States and from each of the Central and South American republics. The members from this country are named below, also those of the special committee and of various group committees:

High Commission—William G. McAdoo, chairman; John Bassett Moore, vice-chairman; John H. Fahey, president Chamber of Commerce of the United States; D. R. Francis, St. Louis; E. H. Gary, New York; A. B. Hepburn, New York; George M. Reynolds, Chicago; Henry P. Davison, New York; Samuel Untermyer, and Dr. Leo S. Rowe, secretary-general.

Special Committee on Visit of American Business Men to South and Central America—James A. Farrell, chairman; John Barrett, director-general Pan-American Union; D. P. Black, president Chamber of Commerce, Pittsburgh; Elliott H. Goodwin, secretary Chamber of Commerce of the United States; S. T. Henry, vice-president McGraw Publishing Company, New York; W. S. Kies, 55 Wall Street, New York; Robert H. Patchin, secretary Foreign Trade Council, New York; James J. Shirley, F. A. Gillespie Company, New York; Willard Straight, New York; Edwin Warfield, Baltimore; John Clausen, San Francisco.

Group Committees

Argentina—Willard Straight, chairman, New York; James A. Farrell, New York; Henry Ford, Detroit; Cyrus McCormick, Chicago; Frank A. Vanderlip, New York.

Bolivia—Joseph P. Grace, chairman, New York; W. F. Bippus, National Cash Register Company, Dayton, Ohio; J. F. O'Neill, president Fulton Foundry Company, St. Louis; Charles M. Pepper, Washington; George C. Richards, Remington Typewriter Company, New York.

Brazil—John Hays Hammond, chairman, New York; J. B. Forgan, Chicago; Frederick Lage, New York; E. W. Rice, president General Electric Company, New York; Mortimer L. Schiff, New York.

Chile—Cleveland H. Dodge, chairman, New York; Robert Bacon, New York; G. L. Duval, New York; David Kinley, University of Illinois; John J. Roskob, treasurer E. I. du Pont de Nemours Powder Company, Wilmington, Del.

Gulf States Steel Company Extension

The Gulf States Steel Company, Birmingham, Ala., has recently contracted for the extension of the soaking pit building at its Alabama City, Ala., steel plant. A set of four-hole soaking pits will be built and an overhead plunger crane will be installed. Two gas producers will also be added. The expenditure will be about $60,000. Other improvements have been recommended by President Bowron to the board of directors, involving alterations in the merchant bar mill and eventually the building of a sheet mill. These will be taken up from time to time as conditions permit, the intention being the ultimate rounding out of a considerable programme of additions.

OBITUARY

Thomas D. West

Thomas D. West, for many years one of the most widely known men in the foundry trade in the United States and a high authority on foundry practice, died at Glenville hospital, Cleveland, Ohio, June 18, from injuries received by being struck by an automobile on the previous day. He was 64 years of age. As chairman of the board of directors of the West Steel Casting Company, Cleveland, he actively co-operated with his son, Ralph D. West, president of the company, but

THOMAS DYSON WEST

for several years had spent much of his time in promoting safety work in foundries and in other efforts for the benefit of foundrymen and their employees.

Mr. West was born in Manchester, England. At the age of 12 he started to learn iron founding at the plant of the Portland Locomotive Company, Portland, Maine. In 1887 he organized the Thomas D. West Foundry Company, Sharpsville, Pa., now known as the Valley Mold & Iron Company, maker of ingot molds. He was vice-president and shop manager from its organization until 1909. He organized the West Steel Casting Company, Cleveland, in 1907.

Mr. West has long been known as a pioneer writer in the field of practical foundry literature and as having been a leader in the movement to place the foundry industry on a higher plane. He was president of the American Foundrymen's Association in 1905 and 1906, and was an honorary member of that association as well as of the Pittsburgh, Philadelphia and other local associations of foundrymen. He was also a member of the American Society of Mechanical Engineers, the American Society for Testing Materials, and several other mechanical and scientific societies. He established the use of the American Foundrymen's Association's standardized drillings for the checking of pig iron analyses and the distribution of such drillings was taken over by the Bureau of Standards at Washington in 1905. Among his later patents was one for "even chilled and true round carwheels," and he devoted considerable attention to the molding and manufacture of chilled carwheels by his improved appliances. He was author of "American Foundry Practice," "Molders' Text Book," "Metallurgy of Cast Iron," "The Competent Life," "Accidents: Their Cause and Remedies," and a large number of technical papers for engineering and foundrymen's associations. Two of his works have been translated into French and German. He was the founder and president of the American Anti-Accident Association, organized in 1908, and was the prime mover for a sane Fourth of July in Cleveland, doing much for the extension of the latter movement throughout the country. He gave a great deal of time to propaganda for the prevention of industrial accidents and his earlier work in this behalf was a larger factor in the general "safety first" movement than had been generally appreciated. He was chairman of the Safety Committee of the American Foundrymen's Association and recently had been devoting himself to safety work in Ohio foundries, being chairman of the committee of the State Industrial Commission which is engaged in drawing up rules for safety and sanitation in Ohio foundries. Among other work initiated by him was the "Back with the Saloon" movement, the object of which was to prevent the location of saloons in close proximity to foundries and other industrial plants.

Those who knew Mr. West best found intensity of application to the work in hand one of his most conspicuous traits. He was hampered by the lack of school training, but he labored with what amounted at times almost to desperation to overcome his handicap. To the task of creating a literature of the foundry he gave time and energy without stint, and in his early days of authorship many a night was spent at his desk, from which he went at early morning to take up again the work of the foundry. Mr. West was impatient with the unwillingness of the average American youth to accept employment which meant soiled hands and clothes, and the perspiration of manual labor. In recent years he wrote strongly concerning the diminishing stock of all-around skill in the foundry and urged a campaign for more thoroughly trained molders and foundry managers.

Mr. West leaves his widow, a daughter and two sons, Ralph H. West of Cleveland, and Dr. Thomas J. West of Honolulu.

ELMER CRAWFORD, president and founder of the Crawford Publishing Company, Chicago, and editor of Mill Supplies, died in that city June 15 from heart failure, aged 53 years. He was born in Michigan and in 1884 was graduated with high honors from the University of Michigan. He then entered the law department of the university, from which he was graduated in 1886, and was admitted to the bar. He took up the practice of law in Detroit and was successful, but his bent for journalistic work caused him to become interested in trade journals. In 1899 he became connected with the Tradesman and the following year he associated himself with Domestic Engineering, becoming vice-president and general manager of that publication. He continued in this position until 1909, when the publication changed hands. In 1910 he established the Crawford Publishing Company. His editorials on trade subjects in its publication have been held in great respect and resulted in his becoming one of the most widely known men in supply trade circles. He leaves his widow, a son and a daughter.

THOMAS M. CUSTER, since 1909 general purchasing agent of the A. O. Smith Company, automobile frames, trucks, etc., Milwaukee, Wis., died June 17 of peritonitis, aged 43 years. He was a native of South Ronaldshay, Orkney Islands, Scotland, and came to America at the age of 20.

EDMUND R. COLLINS, president E. R. Collins Machine Company, Brooklyn, N. Y., died of heart failure June 14 at his home in Dunton, Long Island, aged 59 years. He was born in England and came to this country about 30 years ago. He leaves a son and two daughters.

Plans for the new chemical laboratory building of the Bureau of Standards, Washington, D. C., have been completed. Its maximum cost is $200,000 and advertisements for bids for its construction will be published in June. It is to be located on Pierce Mill road in the northwestern suburbs of Washington, and will form the seventh of the group of special laboratory buildings erected for the bureau.

PERSONAL

Edward S. Knisely, who has been appointed general sales manager of the Bethlehem Steel Company, entered the employ of that company in August, 1890, as an apprentice in the machine shop. After serving the full apprenticeship time he entered Lehigh University, where he spent three years in the mechanical engineering department. Then he took employment in the new plate mill at South Bethlehem as screwman and roller. Returning to the machine shop he was engaged in various capacities from sub-foreman to chief inspector and did special work in the efficiency department. He entered the sales department in 1901, was put in charge of the Pittsburgh office in 1904, and was appointed Western sales representative in 1905, having charge of all of the Western offices.

EDWARD S. KNISELY

Vernon Brown, who has for a number of years been connected with the manufacturing department of the Enterprise Mfg. Company, Philadelphia, has been appointed general manager of the Warren Foundry & Machine Company, manufacturer of cast-iron pipe, Phillipsburg, N. J.

D. R. Mathias, general superintendent of the Joliet works of the Illinois Steel Company, who was operated upon about three weeks ago for appendicitis, has been removed to his home from the hospital. At the time of the operation his condition was exceedingly serious, but complete recovery now seems assured.

Charles U. Geesey, formerly assistant chief chemist at the Gary works of the Indiana Steel Company, has become chief chemist for the Campbell, Wyant & Cannon Foundry Company, Muskegon, Mich.

William A. Sproull, for 25 years traffic manager of the Cambria Steel Company, with headquarters in the Oliver Building, Pittsburgh, has resigned, effective August 1, to take charge of the bureau of transportation and traffic of the Chamber of Commerce of Philadelphia. He was one of the organizers of the Traffic Club of Philadelphia and was its second president. Recently he was elected president of the Traffic Club of Pittsburgh, with which he has been actively connected for some years.

H. C. Crawford has been appointed traffic manager of the Cambria Steel Company. He was formerly in the traffic department of the Carnegie Steel Company, and two years ago went with the Cambria Company as special agent. Lately he has been Eastern traffic manager at Philadelphia, a position created for him, and which will be abolished when he assumes his new position. On July 15 the traffic department of the company will be removed from Pittsburgh to Philadelphia, where Mr. Crawford will have his headquarters. Christian Hershey, chief clerk of the traffic office at Johnstown, will be transferred to Philadelphia, as chief clerk, with jurisdiction over the export shipments of the company, which have increased heavily since the organization of the Cambria Exports Company. W. M. Lorenz, chief clerk at Pittsburgh, will be transferred to Johnstown in the same capacity, and J. W. Cotter, rate clerk, will go to Philadelphia in the same capacity.

David A. Thomas, the well known Welsh coal mine owner, who has been appointed purchasing agent for the Allies in the United States and Canada, is expected to make his headquarters in Ottawa and New York. He will deal directly with makers of arms and ammunition and to an extent, according to London advices, will take up the work heretofore carried on by J. P. Morgan & Co. in connection with war purchases.

Thomas H. Kenvin, formerly connected with the Gary works of the Indiana Steel Company, leaves this week for India to become open-hearth superintendent at the plant of the Tata Iron & Steel Company at Sakchi, Bengal. He is accompanied by his son, Thomas B. Kenvin.

L. F. Boffey has severed his connection of seven years' standing as purchasing agent of the Bosch Magneto Company, Springfield, Mass., but will remain in the employ of the company in a consulting capacity until September 1.

Stewart M. Marshall, for many years chief engineer of the Cambria Steel Company at Johnstown, Pa., is now associated with the Southwark Foundry & Machine Company, Philadelphia, as manager of its turbine and centrifugal pump departments. He will also have charge of all engineering matters relating to apparatus used in conjunction with turbines, such as blowers, electric generators, condensers, etc.

Elwood Jackson, American Car & Foundry Company, has sailed for Petrograd, Russia, on business.

W. F. Robertson, president Robertson Steel & Iron Company, Cincinnati, Ohio, has been honored with the degree of LL.D. by Moores Hill College, Moores Hill, Ind. In honor of the event he was tendered a luncheon June 19 by the Stemwinders' Club, a subsidiary social and business organization of the Cincinnati Business Men's Club.

W. S. Tharp has been appointed Pittsburgh district manager for the Hoskins Mfg. Company, Detroit, Mich. He was formerly with the Republic Iron & Steel Company and later with the Scientific Materials Company and the Metallurgical Testing Laboratories, Pittsburgh.

R. F. Atkins, formerly assistant credit manager at Chicago, has been appointed Eastern credit manager for the Universal Portland Cement Company at Pittsburgh, vice L. S. Fuqua, deceased.

Joseph Battles has been appointed district sales manager at Denver for the Terry Steam Turbine Company, Hartford, Conn., his territory covering New Mexico, Colorado, Wyoming and the western portion of Nebraska. His address is 326 First National Bank Building, Denver.

The Moller & Schumann Company, Brooklyn, N. Y., manufacturer of Hilo varnishes, enamels, and japans, announces that J. A. Bremner resigned the management of its San Francisco branch office, June 1. P. H. Peterson, connected with that office since 1910, assumes charge as the Pacific coast manager.

The semi-annual meeting of the National Association of Brass Manufacturers will be held at the International Hotel, Niagara Falls, N. Y., June 29 and 30. In view of the present cost of raw materials, the high price of metals and other matters of this kind, it is a most propitious time for manufacturers to confer. These are matters of great importance, and the meeting should be well attended.

Pittsburgh and Nearby Districts

The announcement in these columns last week that the Youngstown Sheet & Tube Company would build merchant bar mills at Youngstown, Ohio, and thus enter the steel-bar trade, is of more than passing interest. The building of these mills will give the company a still greater variety of output, and will take up largely its excess output of steel, now rolled into sheet bars to be sold in the open market. The company, which has rapidly grown to be one of the largest independent steel concerns in the country, is still expanding.

The Pittsburgh Steel Company's No. 2 blast furnace, which has been idle for more than a year, was put in blast on Monday, June 14. The company has sold 30,000 tons or more of basic iron to consumers in this district for delivery over the next quarter. Both of its furnaces located at Monessen, Pa., are now in blast, having a combined daily output of 1100 to 1200 tons. About half of this is used in its open-hearth steel plant, also at Monessen.

The Sharon Steel Hoop Company, Sharon, Pa., states that it is running its open-hearth steel plant, sheet bar and finishing mills to full capacity, with considerable orders ahead. This company has made no considerable outlay recently for additions nor in the way of installing new equipment, the only expenditures that have occurred being ordinary in character to maintain the high physical condition of its plants.

The Carnegie Steel Company has bought additional land near Girard, Ohio, the site selected for the new McDonald bar mills projected several years ago. It is believed that probably early next year work on these mills will be started. The plans for these works contemplate the rolling of merchant steel bars, small rounds and other small shapes, the steel to be furnished from the Ohio plant of the Carnegie Company at Youngstown.

On Monday, June 28, the open-hearth steel plant of the Carnegie Steel Company at North Sharon, Pa., which has been idle for nearly two years, will be started. The plant contains six 60-ton open-hearth furnaces, and its output will be billets, sheet bars, plates and skelp. There is also a blast furnace at the North Sharon works, but as yet no orders have been given to start it.

Stockholders of the Wheeling Steel & Iron Company will meet in Wheeling, W. Va., June 30, to take action on an issue of $5,000,000 of 6 per cent. bonds, the proceeds to be used in making large additions to its plants. The company has a tin-plate plant at Yorkville, Ohio, containing 10 hot mills, to which two more are now being added, and it is proposed to double the size of the plant, making 24 mills in all. There will also be extensive additions made to the Bessemer steel plant in Wheeling, and it is probable that the two blast furnaces in Wheeling will be rebuilt.

The Standard Steel Car Company, Pittsburgh, intends to make some large additions to its plant at New Castle, Pa. It has given a contract to the McClintic-Marshall Company, Pittsburgh, for the steel for a new building, 900 tons, to replace a structure destroyed by fire last fall. A large amount of new equipment will be installed and it is the intention to build steel cars complete. Heretofore only parts of the cars were made and assembled for finishing at its works at Butler, Pa.

Rapid progress is being made in the building of the new open-hearth steel plant of the Youngstown Iron & Steel Company, Youngstown, Ohio. It is expected to begin the rolling of steel early in August. The company placed last week an order with the Morgan Engineering Company, Alliance, Ohio, for a 10-ton electric crane of 50-ft. span.

The Moltrup Steel Products Company, Beaver Falls, Pa., manufacturer of cold-drawn milled and ground specialties, has some improvements and additions in contemplation, definite plans for which will shortly be completed.

The Driggs-Seabury Ordnance Corporation, Sharon, Pa., manufacturer of motor car forgings and machine parts, drop forgings and general machine work, is operating its machine shop to about 50 per cent. of capacity, but its pressed steel and forging departments are running double turn.

The American Sheet & Tin Plate Company's advertising department, Pittsburgh, is sending out a folder in which are shown detailed plans of its exhibit at the Panama-Pacific Exposition. It includes a description of the motion picture films, 25,000 ft. in length and requiring six and a quarter hours to exhibit, showing the complete processes of manufacturing the products of the company from the ore to the finished material.

The Federal Radiator Company, New Castle, Pa., recently organized, has been granted a charter with a capital of $600,000. It will manufacture steam and hot water boilers and radiators. It has taken over the plant of the Penn Motor Company at New Castle, which it will occupy. It will also erect new buildings of steel and brick and will be in the market for considerable equipment.

Recent orders received by the Thomas Carlin's Sons Company, Pittsburgh, include one 8-ft. motor-driven wet pan for the American Sheet & Tin Plate Company, one 9-ft. self discharging wet grinding pan arranged for motor drive for the National Malleable Castings Company, Chicago, one No. 18 all steel shear for shipment to Texas, one No. 38 shear for the Iron City Spring Company, and two 3-drum hoists, together with electric light plants and pumps, for maneuver boats for U. S. Engineers at Pittsburgh.

The court has appointed Julian Kennedy, consulting engineer, Pittsburgh; R. M. Hite, Fairmount, W. Va., and R. C. Crawford, McKeesport, Pa., to act as appraisers for the coal properties of J. V. Thompson. Appraisals of these coal properties are to be made it is said, with a view of selling them to raise funds for discharging the obligations of Mr. Thompson, whose affairs have been in the hands of receivers for some months.

The Huessener Engineering Company, Pittsburgh, Pa., has been incorporated to manufacture mechanical devices for the economical combustion of coal. The capital stock is $25,000. H. Huessener is manager.

Smith Steel Casting Company Expanding

The George H. Smith Steel Casting Company, Milwaukee, Wis., has purchased the property on which its foundry has been located for the past 17 years, also buildings and land adjoining, consummating one of the largest property deals in the foundry line in that city in recent years. It is planned to erect shortly a new building, 65 x 150 ft., to serve as a shipping room. This will enable the use of the main foundry building exclusively for molding and casting, thus largely increasing productive capacity.

This company has been manufacturing steel with the converter process about 16 years, having erected and operated one of the first commercial converter foundries in the United States. It is the original maker of dynamo, or low carbon, steel castings for electrical purposes in this country, and also makes alloy steels of various kinds, including manganese, vanadium, nickel and chrome, and castings of special carbon.

Pittsburgh Foundrymen's Association

The annual meeting of the Pittsburgh Foundrymen's Association was held at the Westmoreland Country Club, near Pittsburgh, on the evening of June 21. Officers for the year commencing July 1 were elected as follows: George B. Koch, superintendent of the Pennsylvania Railroad foundries, Altoona, Pa., president; George W. Knotts, United Engineering & Foundry Company, vice-president; William J. Brant, treasurer, and F. H. Zimmers, Union Foundry & Machine Company, secretary. An executive committee was also elected consisting of H. J. Koch, chairman; J. L. Uehler, C. H. Gale, Bayard Phillips and H. W. Petty. The meeting was largely of a social nature, the members of the association being taken to the club in automobiles, and the entertainment included a short baseball game and other sports. No further meetings will be held until September 20.

Machinery Markets and News of the Works

EASTERN BUYING GREATEST

Quest for Shrapnel Machines Continues

Domestic Demand Larger—More Sales Could be Made if Deliveries Permitted

The tide of activity is undiminished and practically the only change to be noted is the gradual shifting of demand from foreign to domestic buyers. The latter, both those who have war business and those who have not, are increasing at a rate which promises well.

New York is more active than some of the Western markets and the latter have been drawn upon for second-hand machine tools to supply Eastern buyers. There is a large number of inquiries for shell-making equipment before the New York trade and business is only restricted by the inability of tool builders to make deliveries in satisfactory time. One item of note is the purchase of 160 automatic machines by the American Machine & Foundry Company, which has a contract for making fuse timers, and another is that the American Locomotive Company and the Westinghouse Air Brake Company will combine in establishing an ammunition plant at Kenilworth, N. J. The International Steam Pump Company is still seeking reasonably quick delivery on shrapnel-making machines.

So many plants are now engaged in the manufacture of shrapnel and explosive shells, and their products are so rapidly increasing in volume, that the number of foreign inspectors is not sufficient. It may be for this reason, as well as because of the eagerness of the belligerents to get shells that is causing the inspection to become a little easier, for that is the case. A Washington company which makes shells and projectiles is building a house on its grounds for the occupancy of the British army officers who are stationed there as inspectors. A new inquiry which has been made recently is for thousands of steel grenades intended to be thrown from the trenches. Some are to be hurled by a specially designed gun and others by hand. They contain a high explosive and nicely adjusted firing mechanism which is set in operation automatically when the grenade is thrown.

Many New England manufacturers are working day and night, or at least to 9 p. m., and automobile truck-parts are being shipped West by express. A number of the shops are working under pressure for the Pratt & Whitney Company, and others for the Remington Arms Company. The latter company has purchased the Robin Hood Ammunition Company, Swanton, Vt.

The demand for lathes is unabated in Cleveland, and more could be done were it not for the question of deliveries. In that city the call for forging machinery is very good. New plants are to be built by the Frantz Premier Company, Cleveland, and the Goodyear Tire & Rubber Company, Akron.

Makers of automobile trucks and automobiles continue heavy buyers in Milwaukee, where there is an increasing demand for heavy machinery and prime movers.

Cincinnati has been visited lately by a number of representatives of foreign machine-tool houses who are seeking to make connections with tool builders. The lathe demand there appears to have slackened.

In the Central South machinery orders are on the increase and there is an especially good demand for power equipment. Boilers, gas engines and electrical equipment lead the demand in Birmingham. St. Louis continues to show little or no improvement.

In the Pacific Northwest mining machinery is more active, and the lumber industry has been given an impetus by large orders.

That a shortage of machine tools exists in San Francisco was brought out by the recent submission of bids for complete shop equipment for the United Army Transport docks at Fort Mason. General business has been quiet in that city.

New York

NEW YORK, June 23, 1915.

The demand for machinery continues to widen and, with more aspirants for war business in the field than ever, there is also a better call from industrial sources. Other markets are not as lively, apparently, as that in this city. Dealers in second-hand machinery are now going to the West for equipment which they can sell quickly here. It is said by prominent dealers that the trade never found collections better than they are at present.

The Wirt Electric Company, Philadelphia, is in the market for several hand screw machines.

At least two Eastern railroads are showing an inclination to purchase machines which they saw displayed at the recent exhibit of the Railway Supply Manufacturers' Association at Atlantic City. The Baltimore & Ohio has a list in hand, but its issuance has been delayed.

The Interborough Rapid Transit Company has in preparation a list of tools needed by the shops of its Third avenue elevated line.

Day & Zimmermann, engineers, 611 Chestnut street, Philadelphia, Pa., have been in the market for general foundry equipment and a new building for the Hitchcock Company, Harrisburg, Pa.

Bids were opened last week for a new building and dock improvements at the plant of the Samuel L. Moore Sons' Corporation, Elizabeth, N. J.

The Borough Council of Kenilworth, N. J., has given the American Locomotive Company and the Westinghouse Air Brake Company permission to manufacture munitions of war in that borough. Negotiations are understood to have been closed whereby the two companies will take over, under a 5-year lease, the plant of the Texoleum Company. Work is to be started at once and it is said that 1500 men will be employed. The Texoleum company has vacated the property.

The American Machine & Foundry Company, Brooklyn, N. Y., has taken a contract for the manufacture of shrapnel fuse-timbers, and has purchased for the work about 160 Cleveland automatics. The same company has inquired for turret lathes of sizes applicable to the manufacture of shrapnel cases.

The Newton Machine Tool Company, Philadelphia, Pa., is considering the purchase of additional equipment.

The demand for shell-making machinery is even greater than it has been in the past. English buyers are now coming forward in greater number and are most disappointed when they learn of the extended deliveries. The Lea-Courtenay Company, New York, has been inquiring for shrapnel-making machines. The William Wharton, Jr., & Co., branch of the Taylor-Wharton Iron & Steel Company, has also inquired for machines to finish shrapnel cases. The company has been forging blanks and might install equipment for finishing them in the new plant of the company at Easton, Pa., if satisfactory deliveries could be obtained. The Cayuta Mfg. Company, Sayre, Pa., is considering the manufacture of 75-millimeter shrapnel shells.

It is reported that the Bethlehem Steel Company will double its projectile capacity. The Frankfort Arsenal, Philadelphia, which is a steady buyer of machine tools, like other

arsenals, has lost some of its skilled men. The latter have left the Government employ to enter that of some of the private shops which are working for foreign governments and who are willing to pay high salaries. A case is cited where one shop employee was given a salary of $5000 a year.

The General Vehicle Company, Long Island City, which, as noted heretofore, has a contract for aeroplane engines, has continued to buy machinery, including a number of automatic screw machines.

The J. G. Brill Company, Philadelphia, is forging shrapnel blanks and would buy machinery for finishing them if sufficiently quick deliveries could be obtained.

The Poole Engineering & Machine Company, Woodberry, Md., has closed a contract for the second lot of shrapnel-making machinery it has purchased in recent weeks.

M. N. Schoemaker, engineer, Union Building, Newark, N. J., is preparing plans for two three-story factory buildings to be erected at Weston avenue and the Pennsylvania Railroad for George Stengel, Inc., leather manufacturer, Waverly, N. J. Bids will be asked about July 30.

The American Thermostat Company, formerly of Elmira, N. Y., has reestablished its business at 101-103 Mechanic street, Newark, N. J.

The Riverside Metal Company, Riverside, N. J., has broken ground for the construction of an addition to its plant, 150 x 400 ft., which it will equip for its regular line of work. F. A. Taylor is president.

The New York City Compressed Brick Corporation is to build a factory on 129th street and Third avenue. It is understood that some of the machinery, at least, is to be obtained from the American Clay Machinery Company, Willoughby, Ohio, and that the building and the machinery will cost $150,000. Hopkins & McEntee, New York City, are architects.

The Superior Motor Specialty Company, manufacturer of spark plugs, has removed from Philadelphia, Pa., to 30 Irving place, New York City, where it has leased manufacturing space.

The Linde Air Products Company, Forty-second Street Building, New York, will have plans completed about October 1, for a one-story plant, 80 x 100 ft., to cost about $30,000, and to be erected at Milwaukee, Wis. Most of the machinery is in stock; but heating equipment will be required.

The Missouri Can Company, a subsidiary of the American Can Company, Fourteenth street and Tenth avenue, New York, plans the construction of a factory at Kansas City, Mo. Details of the construction have not yet been settled on.

The Nineveh Coach & Car Company, Nineveh, N. Y., has increased its capital stock from $15,000 to $150,000, to provide for the construction and equipment of buildings to be devoted to the manufacture of automobile bodies.

The International Arms & Fuse Company has been incorporated with a capital stock of $1,500,000 to manufacture guns and ammunition. George Arents, Jr., 200 Fifth avenue, New York, John A. Harris and James McCann are the directors. The company is not yet ready to disclose its plans.

C. & E. Chapal Freres & Cie., 415 Willoughby avenue, Brooklyn, N. Y., are building a two-story extension to its dyeing works at the above location at a cost of about $10,000.

The Continental Rubber Works, Erie, Pa., will build an addition to its plant for a machine shop, 70 x 100 ft., one story.

The Merrell-Soule Company, Syracuse, N. Y., manufacturer of food products, has let the contract for the construction of a two-story brick machine shop to cost about $14,000. The expenditures in connection with the transfer of the machine department, including the purchase of new equipment, will amount to $20,000.

Ilion, N. Y., has voted $30,000 of bonds for the development of a sewer system.

P. A. Erickson & Son, Portchester, N. Y., are to erect a machine shop, 40 x 120 ft., one story, and annex 30 x 80 ft. Bids are being received.

Incorporation papers have been filed by the Unity Paper Mills, Potsdam, N. Y., with a capital stock of $100,000, by F. L. Cubley, H. Parks and J. F. Obert.

The Hodge Metal Hose Company, Inc., Wellsville, N. Y., has been granted certificate of incorporation with a capitalization of $50,000, to manufacture metal hose connections, etc. E. C. Brown, P. B. Banks and H. W. Breckenridge, Wellsville, are the incorporators.

The Bausch & Lomb Optical Company, 637 St. Paul street, Rochester, will erect a glass-grinding building, 80 x 200 ft., one story.

Incorporation certificate has been issued to the Thomas Brothers Motor Company, Inc., Ithaca, N. Y., with a capital stock of $50,000. The new company will engage in the manufacture of aviation machines, motors, etc. W. T. and O. R. Thomas and H. G. Carpenter are the incorporators.

The Pierce-Arrow Motor Car Company, Buffalo, has let general contract to the Aberthaw Construction Company, Boston, for the erection of an extensive addition to its plant at Elmwood avenue and New York Central Railroad Belt Line, 60 x 400 ft., four stories, of steel and concrete, to cost approximately $200,000.

The Staunton Jar Corporation, Buffalo, N. Y., has been incorporated by G. Staunton, Stamford, Conn.; W. R. Smith and O. R. Blair, 936 Ellicott Square Building, Buffalo, to manufacture glass, hardware, rubber goods, etc. The capital stock is $100,000.

The Rome Metal Mill, Rome, N. Y., has completed plans for a one-story brick and concrete addition to its plant, 180 x 200 ft.

The Enkel Motor Company, Auburn, N. Y., will erect a plant for the manufacture of the Diesel type automobile motor. C. Howard Williams is vice-president and general manager.

The Zunner Machine Company, Furnace street, Rochester, has completed arrangements for building a plant in South Boston, Mass., for the manufacture of brewing machinery. The Boston representative is C. Granger, 203 Winthrop Building.

The Edw. L. Smith Foundry Company, Amsterdam, N. Y., has let contract for the erection of a foundry 40 x 90 ft.

B. M. Anderson, A. M. and C. R. Brandes, Rome, N. Y., have incorporated the Rome Engineering Company and will commence business with a capital stock of $5000.

The Diamond Match Company, Oswego, N. Y., has awarded contract for a powerhouse, 80 x 88 ft. The equipment to be installed includes two 500-hp. boilers with automatic stokers and two 1000-kw. turbo-generators.

The State Hospital Commission, Albany, of which E. S. Elwood is secretary, is receiving bids until June 29 for additions and alterations to powerhouse and for equipment, etc., at the Middletown State Homeopathic Hospital, Middletown, N. Y.

Plans have been completed for the erection of two additions to the cartridge manufacturing plant of James B. Wise, Watertown, N. Y., and for an auxiliary steam plant addition to the powerhouse.

The Fargo Mfg. Company, Poughkeepsie, N. Y., has plans in preparation for additions to its factory to be erected at once. J. J. Wells is the engineer.

The factory to be erected by the Elite Furniture Company, Jamestown, N. Y., will be 54 x 112 ft., four stories. Axel E. Bloomquist is superintendent.

The American Fork & Hoe Company, Binghamton, N. Y., has its new factory, built to replace that recently destroyed by fire, nearly completed and ready for equipment. It is 70 x 70 ft., two stories and basement. M. Abbott is general manager.

Philadelphia

PHILADELPHIA, PA., June 21, 1915.

Shipbuilding projects at Philadelphia, it is reported, include the construction at the Philadelphia Navy Yard of a transport to cost about $4,400,000, the construction of 10 piers, 250 x 900 ft., two stories, the first to cost about $1,500,000, and the entire 10 to cost about $25,000,000; the construction of a small-craft harbor at Allegheny avenue; and the organization of a new shipbuilding company at Chester, Pa. Charles P. M. Jack, consulting engineer, 17 Battery place, New York, represents the last-mentioned company, which will shortly be incorporated.

The American Ice Company, Sixth and Arch streets, Philadelphia, is having plans prepared for an ice-manufacturing plant to be erected at American & Cambria streets, Philadelphia. The building will consist of a boiler room, engine room, etc., and will be constructed of brick and concrete. Walter Lee is Philadelphia manager.

J. G. Skelton, Virginia Railway & Power Building, Richmond, Va., is in the market for a locomotive wrecking crane of 20 to 30-tons capacity.

The National Radiator Company, Trenton, N. J., has started work on the construction of a brick machine shop, 50 x 100 ft. Burton & Burton, Trenton, N. J., are the contractors.

A large pattern works will be constructed at Fourth and Ward streets, Chester, Pa., by Francis J. Moore for Harry F. Krieg, Millmont, Pa. Modern machinery will be installed.

Media, Pa., has voted $70,000 of bonds for electric light and waterworks improvements.

The Mercer Automobile Company, Trenton, N. J., has awarded contract to Burton & Burton, American Mechanics Building, Trenton, for the construction of a one-story addition to its factory, 60 x 400 ft., of brick and steel, to cost about $20,000.

Crane Brothers, Inc., Kingston, Pa., silk throwster, has had plans drawn for the construction of a one-story brick boiler house and machine shop, 28 x 60 ft. George F. Welsh, Coal Exchange Building, Wilkes-Barre, Pa., is the architect.

Catalogues Wanted

The Hamburg Boiler Works, Hamburg, Pa., desires photographs and prices of belt-driven bending rolls to roll ½-in. plate 10 in. wide clear to the edge, forming a complete circle, power raising and lowering of the top roll being provided. It plans to install such equipment. Henry Seiders is proprietor.

New England

BOSTON, MASS., June 22, 1915.

Certain small tools are in large demand for export to Europe. Everything that has to do with an automobile repair kit has a ready market, as is demonstrated by the Billings & Spencer Company's experience that orders for wrenches are now for thousand lots instead of by the gross as formerly.

The Whitney Mfg. Company, Hartford, Conn., manufacturer of transmission chain and hand milling machines, is to extend its factory to give 20,000 sq. ft. of new floor space. This is in addition to other important improvements completed. Milling machines are required in great numbers in arsenal work, and the transmission chain for motor vehicles for European buyers. So great is the present demand for chain that large quantities are shipped to Detroit by express, in spite of the fact that freight facilities between Hartford and Detroit are almost equal to the express service. The company has awarded the contract for the large addition to the present main structure.

The announcement is made that the plant of the Robin Hood Ammunition Company, Swanton, Vt., manufacturer of gunpowder, etc., has been purchased by the Remington Arms Company.

The Parkhill Mfg. Company, Fitchburg, Mass., cotton manufacturer, will build a dyehouse, 100 by 200 ft., four stories.

The Smythe Mfg. Company, Hartford, Conn., manufacturer of book-binding machinery, is working on sub-contracts for Hartford firms which are manufacturing arsenal machinery.

The New Britain Machine Company, New Britain, Conn., manufacturer of multi-spindle screw machines, etc., is rushed to the limit of production. The company has not as yet given work to outside firms, excepting some screw-machine work.

The Pratt & Cady Company, Hartford, Conn., manufacturer of water valves, hydrants and other water and steam specialties, is feeling the effects of the war business through orders received at frequent intervals for such new works as those of the Remington Arms-Union Metallic Cartridge Company at Bridgeport, Conn. The Pratt & Cady plant also has contracts for municipal work.

The Taylor & Fenn Company, Hartford, Conn., manufacturer of drilling machines, is very busy in its machine shops and foundry and has taken on as a standard product the Pratt & Whitney Lincoln milling machine, which it is turning out in lots of 50. The foundry has been increased by adding a building.

The Beaton & Cadwell Mfg. Company, New Britain, Conn., manufacturer of floor plates and plumbers' and steamfitters' supplies, is busy with seasonable work. It is operating on full time, with a full force.

J. T. Slack & Co., Springfield, Vt., will erect a new plant, 220 x 500 ft.

The Hartford Machine Screw Company, Hartford, Conn., is rushing work on its new building, which, with a smaller structure will give 120,000 sq. ft. of new floor space. The factory is pushed to the limit with orders, largely sub-contracts having to do with the war.

Landers, Frary & Clark, Inc., New Britain, Conn., has received a large order for bayonets for a foreign government.

The manufacturers of ball bearings are exceedingly busy. According to the New Departure Mfg. Company, Bristol and Hartford, Conn., which is operating at full capacity, the demand for bearings has been vastly increased. The same condition exists in the works of the Fafnir Ball Bearing Company, New Britain, Conn.

The Billings & Spencer Company, Hartford, Conn., is going ahead rapidly with the conversion of the Columbia factory to its new purposes. The 300,000 sq. ft. of floor space permits of concentrating the present Billings & Spencer Hartford works and those in the village of Dividend. The task of moving equipment to the new plant is now well under way. The heavy machinery is already installed, producing hammers, and some of these are being erected in the forge shop, a building 550 ft. long. The company is exceedingly busy in its heavy machinery department.

The Rice, Barton & Fales Machine & Iron Company, Worcester, Mass., manufacturer of paper machinery, is making rifling machines under sub-contract for the Pratt & Whitney Company, Hartford, Conn.

The Skinner Chuck Company, New Britain, Conn., is occupying its additional building, which makes the main factory 54 x 315 ft., four stories. It is very busy with orders for chucks used in the manufacture of shells.

Chuck manufacturers are just as busy as machinery builders. The Almond Chuck Company, Ashburnham, Mass., is operating 24 hr. a day. The Cushman Chuck Company, Hartford, Conn., in spite of its very largely increased capacity due to its purchase of the Universal Machine Screw Company factory and its enlargement, is rushed to the limit of production. The Jacob Chuck Company, Hartford, is just as busy, its demand coming largely from the automobile manufacturers. It is about to start the construction of a factory at Park street and Rowe avenue, 40 x 104 ft., three stories, of mill construction. It now has its hardening processes done outside. The new factory will have a complete equipment for this work. The Union Mfg. Company, New Britain, Conn., reports the same condition.

The business of A. D. Waymouth & Co., Fitchburg, Mass., manufacturer of special wood-turning tables, has been bought by Robert H. Alison, Harry A. Alison and Franklin S. Davis.

The Baxter T. Whitney Company, Winchendon, Mass., is manufacturing drilling machines, under sub-contract from the Charles G. Allen Company, Barre, Mass., which has large orders for machinery in connection with the arsenal contracts.

The Sigourney Tool Company, Hartford, Conn., is building machinery under sub-contract with the Pratt & Whitney Company.

The Fenn Mfg. Company, Hartford, Conn., has contracts for machinery from the Winchester Repeating Arms Company, New Haven, Conn.

Baltimore

BALTIMORE, MD., June 21, 1915.

The Baltimore Tube Company, Wicomico and Ostend streets, Baltimore, has awarded a contract for a one-story casting shop, 37 x 62 ft., to cost approximately $6000.

J. Edward Harvey has announced the organization of The Harvey Company, Inc., 113 South street, Baltimore, equipped to supply all the needs of railroads, contractors and builders. Mr. Harvey is president. It will have storage yards at Curtis Bay, Md.

Application has been made to the Public Service Commission of Maryland by the Chesapeake & Curtis Bay Railroad Company, to exercise its franchise. It will build and equip a railroad running from Curtis Bay to East Brooklyn, Md. It is stated the cost of construction and equipment will not exceed $200,000. The company has been incorporated by J. Cookman Boyd, Builders' Exchange, Baltimore; Richard D. Upham, John H. Zink, G. Aubrey Beard and Richard B. Pue.

The Protection Company, Inc., Baltimore, has been incorporated with a capital stock of $50,000 by Hugh L. Bond, Continental Building, Baltimore; H. Webster Smith and H. Ralph Cover. It will manufacture burglar alarms, electrical apparatus, etc.

Improvements are to be made by the Pennsylvania Railroad Company at its tidewater terminal at Canton, Md. Announcement has been made that it will soon ask for bids on the improvements, to cost over $1,000,000, including a pier, 66 x 942 ft., coal loading machinery, a coal dumper, thawing house and extensive freight yards.

A boiler-house will be built at the Hebrew Hospital, Baltimore, by John Waters, 23 East Centre street, Baltimore, at a cost of $12,000.

Improvements which will double the capacity of the plant are being made by the Standard Oil Company, Canton, Md. The work has just started. Several new structures will be built. The improvements will probably cost about $500,000. The refining facilities are to be greatly enlarged and a new mechanical department, boiler shop and cooperage shop will be built. The capacity of the storage tanks and stills for refining will be doubled.

The City Council, Lonaconing, Md., has granted a franchise to the Edison Illuminating Company to construct an electric light and power system.

Dayton, Va., will build and equip an electric power plant.

The Jewel Pyrites Mining Company, Mineral, Va., has been organized. It will install a 60-hp. boiler, a pump, a 25-hp. hoisting engine and other machinery. A daily output of 300 tons is planned. Samson Smith, Mineral, is the vice-president.

The Richmond Forgings Corporation, Acca, Richmond, Va., is building a plant for the manufacture of brass forgings, including a brass foundry. The company is putting in some extra forging equipment. The estimated cost is about $12,000. W. R. Williams is vice-president.

The Phoebus Foundry Company, Phoebus, Va., operating a foundry which was recently sold to Mr. Thomas of the Sayre Iron Works, will lease the plant from the new owner and continue their business without interruption. B. L. Williams and C. W. Brite are the members of the company.

Chicago

CHICAGO, ILL., June 21, 1915.

Some of the pressure under which machinery interests have been working in the endeavor to place the many demands of ammunition manufacturers appears to be growing less. There is a great deal of machinery, to be sure, on order which has not yet been delivered, nor is likely to be for some time, as deliveries from the tool builders are still a matter of from 15 to 16 weeks. The letting down in the rush of further new orders, however, is noticeable. The past week brought out little buying locally. Deliveries have begun and installation is under way of the large number of new tools purchased for Crane Company's new Corwith plant. A number of sales of miscellaneous tools to automobile and truck builders is reported. No awards have been announced as yet of pending railroad business.

Chicago, Ill., will receive bids until 11 a.m., June 30, for pumping machinery and auxiliaries. W. R. Moorhouse is commissioner.

The Pettibone, Mulliken Company, Chicago, has had plans prepared for a foundry addition, one story, 44 x 132 ft.

Public garages are to be erected, one for B. B. Davidson, 315 South boulevard, Oak Park, to be 50 x 100 ft., and to cost $9000, and another for F. M. Bernham at Sixty-third street and Western avenue, 50 x 100 ft., to cost $8000.

A. B. Mills has completed plans for a one-story manufacturing plant, 50 x 132 ft., to be erected on Darwyn street, near Milwaukee avenue, at a cost of $10,000.

The National Hose Coupling Company, Chicago, has been incorporated with a capital stock of $10,000 by Mortimer J. Silberberg, 122 South Michigan avenue, Harry S. Sitchburne and Frank G. Westberg.

The Noll-Hauworth Company, Quincy, Ill., has purchased property upon which it plans to build a one-story steel frame factory, 50 x 150 ft., to cost $10,000.

August Gottschlick, Oskaloosa, Iowa, has had plans prepared for an addition to his foundry.

Philip Carlin, superintendent of waterworks, Sioux City, Iowa, will take bids covering additional pumping capacity.

The Electric Automatic Pop Corn Machine Company, Metropolis, Ill., has been incorporated with a capital stock of $15,000 by A. F. Roby, John G. Kotter and E. E. Stephens to manufacture a patented device.

The Monarch Mfg. Company, Council Bluffs, Iowa, manufacturer of lubricating oils, whose plant was destroyed by fire recently, is now erecting a new building, 40 x 68 ft., of concrete and steel, two stories and basement.

The Standard Four Tire Company, Marion, Ind., will remove its plant to Keokuk, Iowa, where $20,000 has been subscribed to secure the business. A factory will be constructed with an annual capacity of 60,000 tires.

E. C. Atkins & Co., Indianapolis, Ind., is about to erect a two-story addition to its plant, of reinforced concrete, 100 x 140 ft., to cost $130,000.

Finley P. Mount, receiver for the M. Rumely Company, Indianapolis, Ind., has under negotiation the disposal of the Richmond, Ind., plant of that company to interests which will use it for the manufacture of ammunition.

Tekamah, Neb., has voted $15,000 of bonds for the extension of the municipal electric light plant to furnish 24-hr. service.

Lakefield, Minn., has voted to issue $31,000 of electric light and water-power plant bonds. E. Anderson is village clerk.

Robbinsdale, Minn., has authorized waterworks bonds in the sum of $15,000.

The Detroit Auto Dash Company, Detroit, Mich., suffered the loss of its plant at Milford by fire April 29. It is erecting on the same site a one-story frame building, 44 x 100 ft., and will equip this with the latest machinery for making glued-up stock. The machinery will be individually motor-driven. They will also build a body shop to handle five or six hundred units a day.

Cleveland

CLEVELAND, OHIO, June 21, 1915.

New demand for lathes for making war material continues active. While no large new inquiries have developed in this territory, some of the plants now working on shrapnel shells are buying additional machinery. Lathe sales could be materially increased could the desired deliveries be secured. An interesting feature of the market is that a number of single purpose machines are being brought out for use in various operations in making ammunition. The demand for machinery not to be used for making war material has improved materially. For example a local plant making forging machinery, for which the demand has been light until recently, is now so well filled with orders that it is being operated double turn. The new business in forging machinery has come largely from car and locomotive builders and forge shops. The crane equipment for the new plant of the Warren City Tank & Boiler Company, Warren, Ohio, has been purchased from the Cleveland Crane & Engineering Company, Wickliffe, Ohio. This order is for eight 10 to 15 ton cranes. Among the new inquiries is one from the William Todd Company, Youngstown, Ohio, for 16 and 18 in heavy duty lathes. The demand for locomotive cranes shows an improvement. Some foreign orders have come recently to Cleveland builders, which would probably have been placed abroad in normal times. Local forge shops are very busy and report a scarcity of hammer men and die makers.

The City of Cleveland will receive bids June 30 for two five-ton gasoline locomotives, galvanized steel pipe and wrought steel pipe for use in the west side tunnel extensions work, and for the heating system for the Nurses Home of the City Hospital.

The Frantz Premier Company, Cleveland, maker of vacuum cleaners, has taken bids through the Samuel Austin & Son Company, Cleveland, for a plant to be erected in East Cleveland. This will include a main building, 60 x 230 ft., a foundry and power plant.

Harry A. Lozier, formerly at the head of the Lozier Motor Company, Detroit, Mich., is planning to organize a new company and establish a plant in Cleveland for the manufacture of motor cars.

The Goodyear Tire & Rubber Company, Akron, Ohio, will shortly begin the erection of large factory additions. These will include an eight-story building 80 x 100 ft., and two seven-story buildings, one 60 x 130 ft., and the other 60 x 189 ft.

The Jahant Heating Company, Akron, Ohio, maker of warm air furnaces, has a foundry building under construction and will hereafter make its own castings.

The Miller Rubber Company, Akron, Ohio, is planning plant extensions. It is stated that these will include three one-story buildings and a six-story building.

The Victor Specialty Company, Canton, Ohio, has purchased the plant of the Carrollton Novelty Company, Carrollton, Ohio, which has been closed down for some time, and will place it in operation for the manufacture of sheet-metal and cast-iron toys. The plant is a three-story brick structure, 60 x 250 ft. The toy manufacturing industry is growing quite extensively in this country as a result of the war which has shut off the supply of German-made toys.

The Gordon Rubber Company, Canton, Ohio, has increased its capital stock from $300,000 to $600,000 and has under consideration the erection of new buildings that will double the capacity of its plant.

The Sandusky River Power Company, Fremont, Ohio, now in the hands of receivers, has taken steps toward reorganization by asking for authority to issue $800,000 in bonds and stocks and it is stated that the present plant will be enlarged materially. The name of the company will be changed to the Ohio State Power Company.

The American Tool & Mfg. Company, Urbana, Ohio, will occupy new quarters in the Gaumers Sons Carriage factory in that city.

The Galion Specialty Company, Galion, Ohio, has been incorporated with a capital stock of $40,000 by M. G. Delaney, C. F. Monroe, and others, to manufacture wood and metal specialties.

It is announced from Toledo that Janus Brothers will remove their aeroplane factory from Baltimore to that city.

Rittman, Ohio, will receive bids until June 29 for constructing a waterworks and furnishing pumping equipment. Vance Hicken is village clerk.

Indianapolis

INDIANAPOLIS, IND., June 21, 1915.

The Kokomo Spring Company, Kokomo, Ind., recently incorporated, will manufacture springs for mechanical work and for upholstery use. It has purchased most of its equipment but will probably purchase additional punch presses, and will be pleased to receive catalogues of wire-working or spring-forming machinery.

The Traylor & Woolf Welding & Cutting Mfg. Company, Indianapolis, has been incorporated with $10,000 capital stock by M. H. Traylor, M. A. Traylor and Burt L. Woolf.

The Haynes Automobile Company, Kokomo, Ind., is building a four-story factory building, including a power plant. It is to be equipped with the latest type of machine tools. The company has also purchased a site for a paintshop, 100 x 132 ft., and it will shortly build an office building. Since January 1 it has purchased about $75,000 worth of machinery.

Lavelle Foundry Company, Anderson, Ind., has purchased property at Chase and Brown streets for a new building, and has acquired the Anderson Tool Foundry where it is installing machinery for the manufacture of light iron castings. The plant will be completed about July 1.

The Bass Foundry & Machine Company, Ft. Wayne, Ind., has booked an order for 203 large tanks from the Dupont Powder Company.

The Reynolds Gas Regulator Company, Anderson, Ind., has received word from John B. Redd, superintendent of the collective gas exhibit at the Panama-Pacific Exposition that it has been awarded the gold medal for gas regulators and gas governors.

North Vernon, Ind., will remodel its electric light plant, adding an engine and generator at a cost of $15,000.

The Southwestern Furniture Company, Tell City, Ind., is preparing plans for a five-story factory.

The Marx Mfg. Company, Royal Center, Ind., has been incorporated with $5000 capital stock to manufacture spirit levels. The directors are W. H. Lutes, F. L. Hand and H. G. Sweet.

The school board, Columbus, Ind., will build a vocational building to cost $40,000.

The Hulett-Law Motor Company, Indianapolis, has been incorporated with $50,000 capital stock to manufacture and repair automobiles. The directors are J. B. Hulett, R. V. Law and W. G. Welborn.

Milwaukee

MILWAUKEE, WIS., June 21, 1915.

The extended schedule of operations maintained by machine-tool builders for months shows no contraction, although the source of the demand has gradually been changed from export to domestic buyers. Deliveries are still being made on foreign business and this class of shipment will continue for some time, although the volume is slowly being reduced. A brisk demand is reported from the Middle West. A large share of this demand comes from automobile and motor truck shops; but manufacturers working on war munitions are good buyers. The purchase of heavy machinery and prime movers is increasing, but is still confined almost entirely to municipal buying. Used machinery of the best class is in improved demand. Fabricators and erectors report business dull, with nothing exceptional in sight.

The Auto Parts Mfg. Company, Milwaukee, has moved its shops from the Stroh Industrial Building to 528-532 Broadway, where it occupies the entire second floor. The change makes it possible to increase the output and add several new devices to its line of products.

The Falls Machine Company, Sheboygan Falls, Wis., manufacturer of automobile motors, is about to erect a testing shop, 45 x 154 ft., one story, of brick. A. C. Clas, Milwaukee, is in charge of plans.

The Whitney Foundation & Engineering Company, Milwaukee, has been incorporated by W. W., E. A. and A. E. Whitney, with a capital stock of $16,000.

The Wausau Farmers Co-Operative Packing Company, Wausau, Wis., awarded the general contract for the erection of its buildings to F. W Krause, Wausau. An expenditure of $175,000 is planned. This project has been noted previously.

E. E. Dillon, architect and engineer, 1039 University avenue, Madison, Wis., is preparing plans for a municipal electric light and water plant, power station, etc., for the village of Westby, Wis., which has voted $30,000 to cover the project.

The shop and welding plant of the Western Fixture Company, 573-575 East Water street, Milwaukee, which was damaged by fire with a loss of $15,000, is to be rebuilt at once. Felix Biegelaar is president.

The plant of the defunct Dornfeld-Kunert Company, Watertown, Wis., is now being operated in all departments by John F. Dornfeld, who purchased the property at auction. He is specializing in fabrication and erection, boilers, stacks, and operating the foundry on custom work.

E. O. Siedschlag, principal owner of E. O. Siedschlag Company, Beaver Dam, Wis., has sold his interest to R. P. Scholz and N. Schweiger, who will continue the business as the Klipper Mfg. Company, manufacturing various articles and devices in brass, bronze and aluminum.

The Mauston Aluminum Company, Mauston, Wis., manufacturer of kitchen utensils and drawn work, has disposed of its equipment, material, stocks and good will to the Aluminum Specialties Company, Manitowoc, Wis., and will retire from business.

The Reliance Iron Works, Stevens Point, Wis., is working on an order for 150 potato-sorting machines for the L. Stark Potato Company, for installation in its warehouses in Michigan and Wisconsin.

The Automatic File & Index Company, Green Bay, Wis., is erecting two wing additions for machine room and cabinet-making.

Cincinnati

CINCINNATI, OHIO, June 21, 1915.

Quite a number of representatives of machine-tool houses in Europe have visited the plants in this vicinity lately. The object of these visits has been more to establish business connections with local firms than to place orders for machines. All are of the opinion that business in Europe will be very good soon after the war ends, and they also refute statements frequently made that there will be any large number of second-hand machine tools put on the market by firms who are now making war supplies.

Both the foreign and domestic demand for machine tools has slackened somewhat, but all lathe makers have enough business in hand to keep them busy for some time. Only a comparatively few orders are reported for shapers, and manufacturers of this class of machines are making lathe or milling machine parts for other firms.

Continued encouraging reports are issued by electrical firms, especially those making and selling the smaller sizes of generators and motors. The portable electric drilling machines have also been good sellers lately. Wood-working machinery, of all kinds, is slow. There is very little demand from the South for sawmill outfits, but a number of combination wood-working machines have been shipped to that section the present month. The foundry situation is unchanged and only those foundries making a specialty of machine-tool castings are operating at normal capacity.

The Stacey Brothers Gas Construction Company, Elmwood place, Cincinnati, recently incorporated, has purchased only a part of its equipment. In the list yet to be bought are a larger number of pneumatic rivetting hammers and metal-punching machines.

The Bickett Machine & Mfg. Company, Cincinnati, which recently purchased the old Eureka Foundry Company's plant, has increased its capital stock from $10,000 to $50,000.

The Herring-Hall-Marvin Safe Company, Hamilton, Ohio, is having plans prepared for an addition to its plant, estimated to cost $40,000. It will be devoted to the manufacture of burglar-proof safes.

The Acorn Mfg. Company, Dayton, Ohio, has been incorporated with $35,000 capital stock by R. R. Ashbrooke, and others, to manufacture sheet-metal specialties. Nothing is known as to machinery requirements.

The Ralston Steel Car Company, Columbus, Ohio, has lately booked quite a large order for box cars from the Pennsylvania Railroad, and is also figuring on business from two other railroad systems. It is stated that no additions to its plant are contemplated at the present time.

The William Koehl Company, Jamestown, N. Y., manufacturer of paper boxes, contemplates moving its factory to Cincinnati. A permit has already been taken out for the erection of a building on Hurlburt avenue, estimated to cost $50,000.

The Diamond Laundry Company, Columbus, Ohio, has been incorporated with $10,000 capital stock by J. A. Baker and others. It will fit up a laundry plant.

The Hub Motor Truck Company, Columbus, Ohio, expects to be in the market soon for the machinery necessary to construct a patented gas-electric truck.

The Spence & Thomas Machine Company, Marietta, Ohio, suffered a small fire loss last week. No delays to orders in hand will result.

An elevator belonging to the Cincinnati Grain Company, Cincinnati, was destroyed by fire, with all machinery, June 8, the loss being about $100,000. It is understood that rebuilding plans will be made.

The Automatic Tank Mfg. Company, Columbus, Ohio, has secured quarters in a building at Main and Gilbert streets, and will manufacture a plumbing specialty. Very little equipment will be required.

W. G. Mills, architect, Columbus, Ohio, has prepared plans for a five-story reinforced concrete building to be erected for the Marietta Paint & Color Company, on East Chestnut street.

The Central South

LOUISVILLE, KY., June 21 1915.

Sentiment among machinery concerns continues to be optimistic, as the result of an increased volume of orders which has been recorded lately, and prospects are reported to be satisfactory. The feeling among manufacturers generally is more favorable to purchases of equipment, and it is stated that longer hours are being observed in most lines of business, short-time operations having been the rule for several months. The demand for boilers, engines, electrical equipment and other power machinery is good. Most special lines are fairly quiet at present. Ice machines are being sold beyond the usual season for installation, due probably to business having been held back. More wood-working equipment is also moving now than for some time.

The new plant of the Columbia Sanitary Mfg. Company, Louisville, has been put in operation. It manufactures plumbing goods, and operates a foundry, enameling plant, brass foundry, etc. George F. Laib is president.

The McGuire & Comstock Machine Company, Louisville, has changed its name to the Louisville Elevator & Machine Company. Louis W. Zettler is president.

The B. & B. Ice & Coal Company has been incorporated in Louisville with $30,000 capital stock, and is equipping an ice factory at Fourteenth and Ormsby streets. Claude N. Boone and L. J. Berngenroth are the principal stockholders.

Samuel D. Jones, business director of the Louisville board of education, will receive bids until June 28 on a new boiler for the heating plant of the Benjamin Franklin school.

The Southern Foundry Company and the Owensboro Wagon Company, both of Owensboro, Ky., are preparing to engage in the manufacture of war munitions. The Southern Foundry Company will make shrapnel and the wagon company rifle parts.

J. Abraham, Shelbyville, Ky., will install a small motor-driven refrigerating plant.

James P. Donovan, Georgetown, Ky., is organizing a company to manufacture a patented steel railroad tie. The plant is to be established at Lexington, Ky.

The Kewanee Coal Mining Company, Kewanee, Ky., is planning the installation of additional equipment, including a boiler, engine, generator, etc.

The Smith's Grove Light & Ice Company, Smith's Grove, Ky., has been organized with $5000 capital stock by J. G. Edwards, J. T. Smith and Edgar Beeler. An electric light system is now under construction by the company.

J. H. Watts, Harriman, Tenn., is president of a company which is being organized to build a mill for the manufacture of headings and other cooperage material.

The American Zinc Company, Knoxville, Tenn., has purchased the Roseberry zinc property near New Market, Tenn., and will install a 400-ton mill to handle the ore. The entire plant will be remodeled.

The Lone Mountain Milling Company, Lone Mountain, Tenn., will equip a cold storage plant.

The Tennessee Copper Company, 2 Rector street, New York City, will install an additional unit at Ducktown, Tenn., to increase its production of sulphuric acid.

The Memphis Terminal Corporation, Memphis, Tenn., has purchased the properties of the Merchants' Cotton Press & Storage Company, and will improve them, constructing docks, installing heavy-duty elevators, etc. W. G. Turner is vice-president.

The Pidgeon-Thomas Iron Company, Memphis, Tenn., will purchase a second-hand 60-hp. oil engine.

Charles Edwards, representing White & Co., Chicago, is reported to have made arrangements for the construction of an electric railway from Lebanon, Tenn., to Smithville, Tenn. It is also stated that the branch of the Nashville, Chattanooga & St. Louis Railway, general offices, Nashville, Tenn., with which the new road will connect, will be electrified.

A. A. Northen, First National Bank, Ashland, Ala., is asking for prices on the following machinery: 50 to 75-hp. electric motors; motor-driven pump, with 6-in. discharge; conveying machinery; cylindrical dryer for reduced ores; jaw crusher with daily capacity of 200 tons; 2 sets of crushing rolls; 4 French buhr mills; reels and sifters for flour mill; shafting, pulleys, belts and other transmission equipment; horizontal closed stationary tanks for oil storage. Second-hand equipment, if in good condition, will be considered.

The Jewell Pyrites Mining Company, Mineral, Va., is in the market for the following equipment: 60-hp. boiler, 75-hp. boiler, pumps, and hoisting engine, with single drum. All of the equipment is to be second-hand. Samson Smith, vice-president, should be addressed.

St. Louis

ST. LOUIS, MO., June 21, 1915.

Dealers report no improvement in business and no real life to what little is moving. The trade generally accredits the failure of this section to show any other than the slowest of improvement to the fact that his territory is too far inland to have felt any direct effect from the war orders, only agricultural products from this area having been benefited. Industrial improvement, it is felt, must necessarily wait on the results of the general effect on business of the activities elsewhere. These are likely to come to their full bearing on this section in the fall. About the only demand developing is for power and mining equipment, with some improvement in electrical requirements. Generally speaking the business now moving is strictly of replacement type. Very little new enterprise demand has been found, and practically nothing in the way of extensions. Collections continue good and banking facilities are easy.

Fire June 18 destroyed the plant of the Hammond Sheet Metal Company, St. Louis, Mo., causing a loss on equipment estimated at about $50,000. It will be replaced at once.

The St. Louis Water Department will at once install a municipal dock with mechanical equipment for handling coal and other heavy supplies.

The New Hampton Electric Company, New Hampton, Mo., has been incorporated with a capital stock of $14,000 by C. A. Rowland, W. A. Denny and E. C. Morgan.

The Chamberlain-Goodloe Motor Company, Kansas City, Mo., has been incorporated with a capital stock of $12,000 by R. E. Chamberlain, E. P. Goodloe and F. E. King.

The Ramsey Auto Mfg. Company, Kansas City, Mo., has been incorporated with a capital stock of $14,000 by J. A. Ramsey, Leo Ramsey and Daniel Abramsky.

Polo, Mo., has granted a franchise to the Water, Gas & Electric Company, Excelsior Springs, Mo., which is in the market for equipment.

Walcott & Co., Joplin, Mo., will install equipment for a 300-ton concentrating plant.

The St. Joe Mining Company, Joplin, Mo., will install a concentrating plant of 250 tons daily capacity, electrically operated.

The J. A. McBride Mechanical Equipment Company, Kansas City, Mo., has been incorporated with a capital stock of $16,000 by J. A. McBride, E. V. Sullivan and C. G. Van Horn.

The Gate City Motor Company, Kansas City, Mo., has been incorporated with a capital stock of $10,000 by H. P. Sutton, J. R. Castor and W. C. Riggs.

St. Joseph's Hospital, Kansas City, Mo., is ready to receive bids for the mechanical equipment of the new institution to be erected at a cost of about $400,000. Wilder & Wight, First National Bank Building, Kansas City, Mo., are the architects.

A. D. Maus and J. B. Leatherman, Gould, Ark., will equip a hardwood mill with a daily capacity of 25,000 ft.

J. J. Cummings will remodel his ginning plant at Pauls Valley, Okla., and install a 150-hp. boiler, expeller, seed, cleaners, etc.

H. C. Badger, Kiefer, Okla., will equip an electric light and power plant, at Oilton, Okla., including two 110-hp. engines, two 80-kw. generators. C. F. Petty is manager.

The Tyrone Light, Ice & Power Company, Tyrone, Okla., will equip an electric light and power plant. Walter J. Harville is in charge.

The Elgin Threshing Machine Company, Elgin, Okla., has been incorporated with a capital stock of $13,000 by O. H. Putney, J. L. Brown and C. W. Compton, and will equip a manufacturing plant.

A pipe line with pumping station, etc., will be equipped between the Cushing oil field and some point in Kansas by Arthur Batty, Buffalo, N. Y.

The J. S. Cosden Company, Tulsa, Okla., will add to its pipe line capacity and also install additional oil pumping machinery.

The Standard Roofing & Material Company, Tulsa, Okla., has been incorporated with a capital stock of $50,000 by R. T. Courtney and J. R. Startzell, Muskogee, Okla., and I. V. Gray, Kansas City, Mo.

Roy Hoffmann, Oklahoma City, Okla., will install about $2000 worth of equipment in a garage and repair shop which he is erecting.

Tulsa, Okla., will install a complete sanitary sewer system, including a disposal plant and some pumping machinery. T. C. Hughes is city engineer in charge.

The Finkbine Lumber Company, Wiggins, Miss., will equip an electrically-driven sawmill at D'Lo, Miss., not a postoffice.

The supervisors of Tate County, Miss., will receive bids until July 5 for equipment for constructing a large amount of levee work. J. A. Wooten, Senatobia, is clerk.

The Robert Lumber & Grain Company, Shreveport, La., has been incorporated with a capital stock of $50,000 by T. G. Roberts, John Weber, H. C. Wildgen and Fred Humberg.

The Louisiana Fiber Board Company, Bogalusa, La., will improve its plant at a cost of about $150,000. G. H. Wood, Monroe, Michigan, is vice-president and general manager. Chicago offices are in the Ft. Dearborn Bank Building.

Birmingham

BIRMINGHAM, ALA., June 21, 1915.

The machinery trade manifests a determined inclination to pick up without marked improvement in any special line. Boilers and electrical equipment are active. Gasoline engines are selling well. A steady gradual improvement is apparent in almost all lines. The outlook for the summer is fair to good.

The 3000-bbl. benzol plant of the Edison Company at Woodward, Ala., has been so far completed as to be able to turn out 2000 bbl. per day, while completion of construction is in progress.

Orrville, Ala., contemplates the building of water works system.

The Old Friends Zinc Mining Company, Atlanta, Ga., has been incorporated by J. H. Hawkins, J. Bruce Hough and Horace A. Field; capital stock, $25,000.

Blakeley, Ga., has voted to establish a municipal ice plant.

W. B. Folmar, Troy, Ala., will establish a mill to grind peas, beans and other products into stock food.

The Eastern Carolina Light & Power Company, Spring Hope, N. C., will construct a hydroelectric plant on Tar River and transmit current to several towns. The first installment to be a 250-hp. power unit, and the ultimate, 2000 hp.

It is reported that the Hillyer & Sperring Company, P. O. Box 371, Jacksonville, Fla., is in the market for a new or second-hand steam hammer of 8000 lb.

Pensacola, Fla., has voted $30,000 of bonds for the construction of a waterworks plant.

Texas

AUSTIN, TEXAS, June 19, 1915.

The grain harvest is now well advanced and the money from this source is expected to cause a general improvement in the machinery and tool trade and in business generally. The gas-engine trade is unusually good at this time. The movement among the farmers of installing gas engines for power purposes is spreading rapidly.

The Munger Oil & Cotton Company, Mexia, is making improvements to its cotton-seed oil mill.

The Central Service Company, El Campo, has been organized to build and operate an electric light and power plant and ice factory. It has a capital stock of $200,000. P. J. Hardy, of El Campo, is an incorporator.

S. A. Lillard and J. F. Lillard, Decatur, who recently purchased the Werkheiser-Polk flour mill at Temple for $100,000, will make extensive improvements to it.

C. Bender & Sons will build a sawmill at Humble which will have a daily capacity of about 100,000 ft. of lumber. The equipment will consist of an 8-band mill, an edger with ten saws, etc.

Dabney White, Tyler, will install machinery for manufacturing cotton-seed products and peanut oil.

The Ft. Worth Oil Barrel Mfg. Company, Ft. Worth, has been organized to manufacture oil barrels and tanks. Machinery and other equipment will be required.

The International Brick Company, Las Cruces, has been chartered under the laws of New Mexico, with a capital stock of $200,000.

The El Paso & Southwestern Railroad will build an addition to its shops at El Paso.

Mesa, Ariz., has voted $75,000 of bonds for a sewer installation.

The Goar Brothers Company, Houston, Texas, manufacturer of handles, will remove its factory to Texas City. The factory building, estimated at a value of $22,000, will be moved to the new location. It has a capacity of about 200 dozen handles a day.

San Francisco

SAN FRANCISCO, CAL., June 15, 1915.

The only recent machine-tool inquiry of real importance was for a complete shop equipment for the United States Army transport docks at Ft. Mason, for which bids were opened June 15. Bidding on this lot brought out the fact that several merchants were unable to bid on many items, owing to scarcity of stock and delay in deliveries; and that machine-tool prices in general are held at a higher basis than a few months ago. Aside from this inquiry, business has been of the usual single-tool order, and principally in the garage trade. Stocks of new tools are getting rather closely cleaned up, the shortage extending to other tools than lathes. A good many second-hand tools are still on the market; but most of the desirable offerings are said to have been disposed of.

Miscellaneous lines have changed little. Activity in mining is increasing, and results in more numerous orders, though some hesitation is shown about undertaking important new projects. A normal summer increase is noted in the call for pumping machinery, and some expansion of hydroelectric developments is looked for. Several implement shops continue to work overtime; but general shop and foundry business is dull.

Considerable activity is reported in the Hawaiian Islands. A recent report from Honolulu quotes C. J. Hedemann, manager of the Honolulu Iron Works, a manufacturer of sugar-mill machinery, as saying that the plant has enough business to keep it occupied the rest of the year.

Work has been started on the new Hanlon drydocks, Oakland, Cal. In addition to the drydocks, marine ways of 3000 tons and 500 tons will be constructed.

It is announced that the Santa Barbara Gas & Electric Company, Santa Barbara, Cal., has plans for additions to its plants for this summer, to cost about $80,000.

The Wallace Egg Carrier Company, Richmond, Cal., is preparing to build a package factory.

C. F. Zachary and E. S. Sondral are building a sash and door factory at Anderson, Cal.

The Pacific Northwest

SEATTLE, WASH., June 15, 1915.

The lumber business in the Northwest has been given a marked impetus by the placing of several large orders recently, and several others are in prospect. Notable among recent contracts is the award to W. R. Grace & Co., Seattle, for furnishing to the Panama Canal Commission 1,350,000 ft. Machinery men report a decided improvement in the past few months as compared with last year's business. A number of orders, as a result of war business, have come from the East to Puget Sound manufacturers. Improvement in the copper-mining industry, resulting from the high price of the metal, is understood to have caused a better demand for mining machinery. Irrigation machinery and equipment for municipal projects continue in good demand.

The largest salmon cannery deal of record in the Pacific Northwest will be consummated when deal is completed for the sale of the canneries of Gorman & Co., Seattle, to the Booth Fisheries Company ,for $800,000. The deal is of great importance to the industry, as the entry of Eastern capital into the salmon-packing business is expected to do much toward its improvement.

A 10-brick kiln plant is to be built in Plummer, Idaho, by the Perth Amboy Terra Cotta Company, 1170 Broadway, New York City. The plant will cost about $500,000, and will manufacture terra cotta, brick, sewer pipe and paving blocks. A main distributing office is to be located in Spokane, Wash.

Florence, Ore., has voted bonds in the sum of $10,000 for a municipal water system.

The sawmill of Clark Brothers, near Tenino, Wash., was completely destroyed by fire, with a loss of $50,000. The

mill had a capacity of 40,000 ft. daily. It is stated that it will be rebuilt this summer.

The Sperry Flour Company, Tacoma, Wash., will build an addition to its plant in Tacoma, which will increase its capacity to 4000 bbl. per day. The new plant will cost $65,000. Plans are being prepared by Bullard & Hill, Provident Building, Tacoma.

A recent fire in Portland caused damage of more than $300,000, principally to mills and warehouses. The plant of the Standard Box & Lumber Company, Portland, Ore., was completely destroyed with loss estimated at $170,000. Acme Planing Mill Company's loss was $90,000.

The plant of the Coast Culvert & Flume Company, Kenton, Ore., will be doubled by the installation of new machinery. The company will also add to its products, smooth pipes, tanks and metal troughs, and the improvement will increase the total plant value to $100,000. John S. Beall is manager.

The Merchants Central Heating Company, Spokane, Wash., was recently incorporated for $500,000, with Harry A. Flood president and H. D. Harris vice-president. The business of the company will be to supply steam heat to office and other buildings.

W. W. Mainer, Olympia, Wash., has been granted franchise to erect and operate a power plant in that city.

The Mountain Trailer Company, Spokane, has been organized by J. O. Mountain, of the Diamond Carriage Company, Arthur H. Herta of the Signal Truck Company, and M. D. Hawkins of the Hawkins Motor Car Company, to construct a plant in Spokane to manufacture a patented trailer to hook on to an automobile.

The Bridgeport Water Company, Bridgeport, Wash., has increased its stock to $75,000. It is understood to plan improvements to its plant.

Choteau, Mont., will advertise for bids for constructing a water system to cost $42,000.

Beaverton, Ore., has commissioned Louis C. Kelsey, consulting engineer, Selling Building, Portland, to immediately prepare plans for sewer system to be constructed at a cost of $25,000.

The Discovery Bay Improvement Company, Port Townsend, Wash., has been incorporated with a capital stock of $60,000, by John Siebenbaum and Martin Samuelson. It plans to construct a power plant, build a railroad, etc.

August Guighard, Salem, Ore., has received permit to appropriate 400 second-feet of water in Hood River, where he plans the development of 2270 hp. A plant will be erected at the junction of Farmers' Ditch and Hood River, estimated to cost $300,000.

George R. Schofield, Greer, Idaho, who plans the construction of a sawmill at Weippe, has begun foundations for the plant, which will have a capacity of 100,000 ft. daily.

The Ox Flat Irrigation Company, Vale, Ore., contemplates the development of 5000 hp. by use of the waters of the Payette River. H. W. Clements is secretary.

Frank Nibley, Portland, Ore., is negotiating for a site in Portland or vicinity, on which it is planned to erect a sugar refinery, estimated to involve an expenditure of several millions of dollars.

The Seattle Construction & Dry Dock Company, Seattle, will begin work immediately on the construction of three submarines to be built for the United States Navy at a cost of $1,500,000. W. R. Sands, San Francisco, will personally superintend the construction.

Canada

TORONTO, ONT., June 21, 1915.

It is officially announced that the Dominion Iron & Steel Company, Sydney, N. S., is considering the installation of machines and lathes suitable for the turning out of finished shells.

A plant for the manufacture of shells is being erected at Cobourg, Ont., for George Thompson, who is forming a company with a capital stock of $150,000. Part of the machinery has been purchased. Machinery will also be installed in an adjacent building for the manufacture of tools, etc. J. E. Chambers is superintendent.

The Canadian Cartridge Company will erect a factory at Hamilton, Ont., to cost $40,000. An agreement with the City Council has already been reached regarding the site.

The Norwood Engineering Company, Cowansville, Que., is erecting a factory for the manufacture of shrapnel shells.

The Smith Foundry Company, St. John, N. B., has received an order for war munitions from the British War Office amounting to $125,000.

Machinery will be installed by the Buckeye Machinery Company, Calgary, Alta., for the manufacture of shrapnel shells.

The National Hardware Company, 95 Barrie road, Orillia, Ont., will install machinery for the manufacture of shells, etc.

The C. S. Hyman Company, Richmond street, London, Ont., will install electrical equipment to develop an extra 200 h.p.

The Canadian Copper Company, Copper Cliff, Ont., will commence at once on the construction of a blast furnace.

A machine shop will be constructed by McKinnon Holmes & Co., Sherbrooke, Que., in connection with its present plant.

The Ford Motor Car Company of Canada, 297 Dundas street, London, Ont., will build a three-story addition to its plant next year.

The Utilities Commission will erect a sub-station on Sherbrooke street, Peterborough, Ont., to cost $41,800. H. O. Fisk is the engineer.

The Acadia Gas Engine Company, King street, Bridgewater, N. S., will spend $10,000 on an addition to its foundry. It will purchase new machinery.

The Canadian Hart Wheel Company, Hamilton, Ont., will make an extension to its plant to cost $3000.

An explosion at West Toronto caused about $2000 damage to the plant of the Gurney Foundry Company.

Fire completely destroyed the roundhouse of the Canadian Pacific Railway at Owen Sound, Ont., and damaged a number of locomotives. The loss will amount to several thousand dollars.

Fire destroyed the sawmill owned by M. Sabourin at St. Laurent, Que., with a loss of about $10,000.

The Luitwieler Pumping Engine Company of Canada, Ltd., London, Ont., with a capital stock of $200,000 has been incorporated by Edward E. Middleton, 157 Bay street, Toronto; Samuel W. Luitwieler and Norman E. McLeod, both of Rochester, N. Y., and others, to manufacture pumps, pumping engines, repairs, accessories, etc.

The Faced Brick & Machinery Company, Ltd., Toronto, Ont., has been incorporated with a capital stock of $100,000 by Walter G. Sunter, 52 Dupont street, Toronto; Leonard R. Whiting; Percy E. McMillen, and others, to manufacture brick and brick-making machinery, etc.

Gillespie Brothers, Ltd., Toronto, Ont., has been incorporated with a capital stock of $40,000 by William W. Vickers, 77 York street, Toronto; Paul D. Gillespie, William H. Millman, and others, to manufacture machinery, mechanical devices, etc.

The R. Lawrence Smith, Ltd., Montreal, Que., with a capital stock of $50,000, has been incorporated to manufacture and repair boats, ships, etc. The incorporators are Darley Burley-Smith, manager; William I. Gear, A. H. Elder, and others, of Montreal.

The Hamblin-Brereton Company, Ltd., Winnipeg, Man., has been incorporated with a capital stock of $50,000 to construct and equip mills, factories, etc. The directors are William H. Hamblin, Alexander Adams, John J. Keeland, and others, of Winnipeg.

The Morris Lumber & Coal Company, Ltd., Morris, Man., has been incorporated with a capital stock of $40,000 to manufacture lumber, etc.

The Pacific Timber Holdings Company, Ltd., Vancouver, B. C., has been incorporated with a capital stock of $100,000 to manufacture timber, etc.

J. Nuttall, Cowichan Station, Victoria, B. C., is in the market for a steam engine and boiler of from 10 to 15 h.p.

Eaton Brothers are erecting a machine shop at Reston, Man. The machinery has not yet been purchased.

The Canadian Pacific Railway will build a roundhouse and turntable at Okanagan Landing, B. C. J. F. Richardson, Vancouver, B. C., is superintendent.

W. K. Baldwin, Baldwin Mills, Que., is in the market for machinery, shafting, belts, etc., for the equipment of a sawmill to cost $10,000.

Preston, Ont., will grant a bonus of $21,500 to the Henry Mountain Company, in return for which the company will erect a branch factory there.

The D. J. Barber Foundry Company, Ltd., Brighton, Ont., will make additions to its plant. L. D. Ross is a director.

The board of commissioners, Montreal, Que., will build a pumphouse. Information may be had from the commissioners, City Hall, Montreal.

The Sorel Bottling Company, Sorel, Que., whose plant was recently destroyed by fire will be rebuilt and re-equipped.

The cheesebox factory of John E. Playfair, Playfair, Ont., recently destroyed by fire, will be rebuilt. New machinery will be required.

The ratepayers of Penticton, B. C., passed a by-law to raise $6000 for extensions to its electric light plant.

Ottawa, Ont., will install an electric pump at its main pumping station. Work will be started at once.

The Union Brewery, 592 Cadieux street, Montreal, Que., was destroyed by fire with a loss of $50,000.

The Pitts Construction Company, Ltd., Ottawa, has been incorporated with capital stock of $50,000 to carry on the business of an engineering and construction company. Herman H. Pitts, Gordon M. Pitts and Clarence M. Pitts, all of Ottawa, are the incorporators.

Hepburn Brothers, Ltd., Montreal, has been incorporated with a capital stock of $100,000 to manufacture hardware, machinery, tools and contractors' supplies. The incorporators are Waldo W. Skinner, William G. Pugsley, and George G. Hyde, all of Montreal.

P. Potvin's sawmill at St. Felix d'Otis, Que., has been destroyed by fire.

The Western Foundry & Metal Company, Ltd., and the Canadian Equipment Company, Ltd., both of Calgary, Alta., and the International Supply Company, Ltd., Medicine Hat Alta., have been amalgamated under the style of the Canadian Western Foundry & Supply Company, Ltd. The capital stock is $1,000,000, and the head office is at Calgary. T. A. McAuley and W. H. McLaws, Calgary, and G. A. McKenzie and W. R. Martin, Medicine Hat, are the executive committee.

The Whitby Brick & Clay Products Company, Ltd., Whitby, Ont., has been incorporated with a capital stock of $250,000. The incorporators are J. F. McGregor, T. S. H. Giles and W. C. H. Swinburne, all of Whitby.

Fire has destroyed the sawmill of Adelard Dubois, Hebertville, Que., with a loss of $25,000.

The planing mill of D. Barker, North Bay, Ont., has been destroyed by fire.

The Pembroke Lumber Company, Pembroke, Ont., whose planing mill was recently destroyed by fire, will install a small plant temporarily.

The Gres Falls Company, Three Rivers, Que., will rebuild its sawmill and mill for cutting pulpwood, recently destroyed by fire.

The Acme Paper Box Company, Ltd., Winnipeg, Man., has been incorporated with capital stock of $40,000 to manufacture paper and wood boxes. The incorporators are Oscar E. Flanders and Frederick C. Kennedy, both of Winnipeg.

The Ontario Paper Company, Thorold, Ont., is considering the installation of a third paper machine. Warren Curtis, Jr., is manager.

Dorchester, Ont., will erect a distributing plant for hydroelectric power at a cost of $4300. W. B. Lane is town clerk.

Hydroelectric equipment for developing an additional 200 hp. is contemplated by the C. S. Hyman Company, tanners, London, Ont.

Petrolia, Ont., may install hydroelectric power and remodel the present plant at a cost of $35,000. J. McHattis is town clerk.

The factory of the Sorel Bottling Company, Sorel, Que., recently partially destroyed by fire, will be rebuilt and machinery will be required.

Government Purchases

WASHINGTON, D. C., June 21, 1915.

The United States Engineer Office, Pittsburgh, Pa., will receive bids until noon, June 30, for furnishing a waterpower driven air compressor plant for dam No. 10, Ohio River.

The commanding officer, Frankford Arsenal, Philadelphia, will receive sealed proposals until June 24, under proposal No. 290, for furnishing two Hendey engine lathes or equal, 12-in. swing, 6-ft. bed.

The United States Marine Corps, Lieut.-Col. Cyrus S. Radford in charge, will receive sealed proposals until July 9 for furnishing one steam engine and one 1875-kw., 240-volt, 60-cycle alternating current generator.

Bids were received by the Bureau of Supplies and Accounts, Navy Department, Washington, June 15, for supplies for the navy yards, as follows:

Schedule 8361, Ordnance

Class 151, Newport—Two vertical turret lathes—Prentiss Tool & Supply Company, $2945.

Schedule 8364, Construction and Repair

Class 163, Norfolk—Two hydraulic lifting jib cranes—Southwark Foundry & Machine Company, $640; William H. Wood, $657.50; R. D. Wood & Co., $725.

Schedule 8365, Steam Engineering

Class 171, Annapolis—One testing machine—Tinius Olsen Testing Machine Company, $2100.

Schedule 8383, Ordnance

Class 301, Newport—Two vertical spindle milling machines—Brown & Sharpe Mfg. Company, $1606.50; Hill, Clarke & Co., $1150; Manning, Maxwell & Moore, $1410.

Judicial Decisions

ABSTRACTED BY A. L. H. STREET

PHASES OF CONDITIONAL SALES.—Under the requirement of the New York laws that where a seller of personal property, under a contract reserving title in himself until payment of the purchase price, retakes the property on the buyer defaulting in payments, he must return payments made by the buyer, unless the property be resold within 30 days, that period must be computed from the time heavy machinery so retaken is loaded on board cars, unaffected by any delay in transportation back to the seller's place of business. But the buyer may waive the seller's duty to make a resale in consideration of release from further liability under the contract. When the buyer under a conditional sale contract becomes bankrupt the trustee of his estate becomes vested with all his rights, subject to the right of the seller to reclaim the property the same as if bankruptcy had not intervened. In such cases the seller may either reclaim the property or file a claim against the estate for the balance due on the contract. (New York Supreme Court, Appellate Division, Breakstone vs. Buffalo Foundry & Machine Company, 152 New York Supplement 394.)

DUTY TO TRESPASSING CHILDREN.—The courts of Connecticut do not follow the rule laid down in many other States to the effect that a manufacturer whose premises are naturally attractive to children as a place to play must exercise care to safeguard them against injury. The Supreme Court of Errors of Connecticut holds that an owner or occupant of land owes no duty to a trespasser, whether child or adult, to keep the premises in a safe condition. One who enters another's land assumes all dangers arising from the condition of the premises. (Pastorello vs. Stone, 93 Atlantic Reporter 529.)

DUTIES OF EMPLOYER AND EMPLOYEE CONCERNING INSPECTION OF APPLIANCES.—A workman is under no duty to observe increasing dangers of his work resulting from gradual wear and tear of machinery at which he works, until danger becomes so apparent that a reasonably careful man would discover the condition. On the other hand, the employer must exercise constant inspection to discover changes, and then either notify the workmen of dangers existing or have defects repaired. (Georgia Court of Appeals, Mith vs. City of Rome, 84 Southeastern Reporter 734.)

PROOF OF DEFECTIVE CONDITION OF CHISEL.—An employer may be found to have been actionably negligent in failing to provide an injured workman with a reasonably safe chisel, on proof that the accident was caused by particles of steel flying from the tool under circumstances where that would not have happened had the tool been kept in proper condition. (Kansas Supreme Court, Hovis vs. Cudahy Refining Company, 148 Pacific Reporter, 626.)

NOTICE OF CANCELLATION OF CONTRACT.—Provision in a contract for sale of goods that the buyer shall have the option to cancel the agreement by "serving" 30 days' notice does not require written notice. (Appellate Term of New York Supreme Court, First Department, Lang vs. Lux Mfg. Company, 153 New York Supplement, 292.)

WAIVER OF BREACH OF WARRANTY.—Even when goods are sold under warranty by the seller as to their quantity, the buyer is not entitled to interpose a defense of breach of that warranty, if he failed to examine the goods and to elect to reject them within a reasonable time after delivery. He may, however, claim a deduction from the price of the amount of damages he proves he has suffered through the breach. (New York Supreme Court, Appellate Division, Silberstein vs. Blum, 153 New York Supplement, 34.)

OPERATION OF BALING MACHINES.—An experienced operator of a machine used in baling loose scrap wire cannot recover for injury received through the obvious danger of placing his hand inside the machine while it was in motion, especially where the machine could have been readily and quickly stopped. (St. Louis Court of Appeals, Piorkowski vs. A. Leschen & Sons Rope Company, 176 Southwestern Reporter, 258.)

Trade Publications

Power Hoisting and Carrying Machines.—C. S. Harris Company, Rome, N. Y. Catalogue and circular. Pertain to a power hoisting and carrying machine for hoisting, lowering and carrying at the same time loads which are ordinarily transported and handled by hand trucks and tackle blocks. The special features of the machine are simultaneous elevating and carriage, ease of control and the fact that no floor space is required. An illustration of the machine itself is presented together with a number of views of it in use in factories, warehouses, etc.

Molding Machines.—E. H. Mumford Company, Front and Franklin streets, Elizabeth, N. J. Catalogue. Describes and illustrates a line of molding machines which includes electric and pneumatic jolt ramming and squeezing and combined jolt and squeeze ramming machines and vibrators. Brief descriptions of the machines are employed to supplement the illustrations, although chief reliance is made upon the engravings to tell the story. Suggestions on the use of pneumatic vibrators are included together with engravings showing the various parts.

Small Spot Welding Machines.—Toledo Electric Welder Company, Knowlton and Langland streets, Northside, Cincinnati, Ohio. Bulletin No. 16. Contains illustrations and descriptions of a line of small spot welding machines, designed for either foot or power operation. After briefly pointing out the advantages of spot welding metal sheets, views of the machines in operation and some of the work produced by them are presented to supplement the illustrated descriptions. In connection with the descriptions of the several machines, brief specifications are presented and a number of tables of useful information are included.

Board Drop Hammers.—Chambersburg Engineering Company, Chambersburg, Pa. Wall hanger calendar measuring 17½ x 35 in. An engraving of one of the company's board drop hammers which was illustrated in *The Iron Age*, March 7, 1912, occupies the upper portion of the hanger, while the calendar pad which has easily read figures and covers the year from June 1, 1915, to May 31, 1916, is below. A smaller calendar for the complete years of 1915 and 1916 is given under the pad.

Boilers and Engines.—Chandler & Taylor Company, Indianapolis, Ind. Four bulletins. The first, No. 127, deals with a line of horizontal tubular boilers that are built with half, three-quarter and full fronts and Dutch ovens. A brief description of the construction of the boilers is presented supplemented by specification and dimension tables and engravings of the various parts. Mention is also made of some of the steel casings used and a portable firebox type of boiler. Bulletins Nos. 128 and 131 treat of steam engines for direct connection to electric generators and belted steam engines with throttle and automatic cut-off governing. In both bulletins after a brief general description of the engines, the construction is gone into at some length, the text being supplemented by halftone engravings of the various parts. Bulletin No. 130 shows the general proportions of a balanced piston valve for use with superheated steam up to a temperature of 550 deg. The construction of the valve is gone into at some length, there being numerous references in the text to the drawings showing the construction.

Engine Lathes.—Pittsburgh Machine Tool Company, Braddock, Pa. Three circulars. Illustrate and give specifications of the company's 26, 32 and 34 in. lathes, the two former being of the double back geared type, capable of cutting from 1 to 16 threads per in.

Presses, Headers, Slotting Machines, etc.—E. J. Manville Machine Company, Waterbury, Conn. General bulletin No. 50. Is composed of a collection of bulletins which describe and illustrate single-acting open back, single-acting pillar, double-acting crank, single-acting cut and carry, bench, multiple plunger, ratchet dial and foot presses; single and double-stroke, solid and open die headers; ball blank headers; screw thread rolling machines; automatic screw slotting machines; automatic bolt head trimmers; surface grinders; automatic four-slide wire forming machines; cam milling machines; automatic saw grinder; screw slotting saws and a treatise on the art of screw thread rolling. In each instance the construction and the work done by the machine is described and full specifications given.

Boilers and Heaters.—Gem City Boiler Company, Dayton, Ohio. Bulletins Nos. 70, 71, 72, 73, 74 and 76. The first takes up a line of exhaust steam feed water heaters and improved heaters and lime extractors showing their construction and operation. No. 71 gives illustrations and specifications of the company's standard plain vertical boiler while No. 72 is concerned with return tubular portable boilers. No. 73 deals with steel plate boiler fronts of the full flush, three-quarter, half-arch and full arch styles. No. 73 gives illustrations and specifications for internal furnace boilers and No. 76 takes up standard specifications for horizontal return tubular boilers, explaining design, workmanship, tests, etc.

Refrigerating Machinery.—Henry Vogt Machine Company, Louisville, Ky. Catalogue. Discusses and shows by diagram the system of operation of these refrigerating machines and then proceeds to an illustrated description of the parts. Simplicity is the special claim for this system. The catalogue also gives some space to a general description of the facilities of the Vogt factory and includes a number of views of installations of its machinery.

Steel.—Colonial Steel Company, 324 Fourth avenue, Pittsburgh, Pa. Catalogue No. 11-B. Contains much information regarding the use of Colonial high-speed steel in lathe and planer tools, disks and dies and gives a rather extended discussion of its No. 7 tool steel. Much useful information is included on annealing, hardening and tempering carbon steels, the selection of tool steel, etc. Many tables of information of value to steel users are also included.

Engines and Compressors.—Jacobson Machine Mfg. Company, Warren, Pa. Bulletins Nos. 51, 53, 56, 57 and 60. The first two take up single and double cylinder belt and motor driven air compressors. No. 56 takes up a line of single and double burner soldering furnaces. The last two are concerned with a line of stationary and portable gas, gasoline and kerosene engines of from 1½ to 16 hp. and equipment parts.

Universal Cutter and Tool Grinding Machines.—Cincinnati Milling Machine Company, Cincinnati, Ohio. Two bulletins. Concerned with two styles of cutter and tool grinding machines, one of which is of the plain type and the other a universal machine. Both machines are described at some length and a number of illustrations are included showing how various kinds of tools and cutters are ground.

Industrial Plants.—Westinghouse, Church, Kerr & Co., 37 Wall street, New York City. Pamphlet. Illustrates a number of industrial plants that have been constructed by this company. In connection with the illustrations brief descriptions of the plants are presented and a partial list of buildings constructed by the company is included.

Hand Elevators.—Kimball Bros., Council Bluffs, Iowa. Collection of circulars. Take up types of electric and belt power passenger and freight elevators for factories and storehouses and also a line of floor and overhead winding machines and motors.

Self-Measuring Gasoline Tank.—S. F. Bowser & Co., Inc., Ft. Wayne, Ind. Three booklets. Deal with the Bowser self-measuring stationary and portable tanks for garages and factories, which may be used for gasoline, lubricating oil, linseed oil, paint, etc.

Insulating Brick.—Armstrong Cork & Insulation Company, Pittsburgh, Pa. Two booklets. Discuss a porous insulating brick made of a mixture of diatomaceous earth and cork from which, after molding, the cork has been burned out. They are made for use in ovens, furnace doors, gas producers, waste heat mains, boiler settings, stacks, etc. Special claims are low heat conductivity, convenient form for handling, ability to withstand high temperatures, strength for arches and moderate cost.

Regrinding Valves.—McNab & Harlin Mfg. Company, 55 John street, New York City. Bulletin. Describes in detail and illustrates a type of valves for power plant use. A feature of the valves is that they may be reground and the disk and seat ring renewed without removal from the line.

Plunger Pumps.—Scranton Pump Company, Scranton, Pa. Bulletin No. 102. Describes and illustrates a type of duplex plunger pump for any fluid at either high or low pressure. The advantage of the double-acting principle is obtained by dividing the cylinder of the water end by a central partition, each chamber having its own plunger and stuffing box. A list of parts numbered to correspond to a drawing of the pump is included.

Electrolytic Oxygen and Hydrogen.—International Oxygen Company, 115 Broadway, New York City. Booklet. Dwells chiefly on the economy of the production of oxygen for welding and cutting in the place where it is to be used, such as industrial plants, foundries and machine and railroad shops. The advantages of the system are touched upon and instructions for operating it are included together with diagrams showing the way in which the generators can be grouped. Practically all of the illustrations are of installations at various points in this country and abroad. Mention is also made of the accessories used in connection with the system, such as stud and regulating valves for shipping tanks and apparatus for testing the purity of the oxygen and the gauges used.